SCHOOL EDUCATION IN INDIA

Present Status and Future Needs

The Silver Jubilee of the NCERT (1961-86) marks a quarter century of active development in the history of school education in India. This occasion provides an opportunity to reflect on its past performance and to reorient its future programmes in the light of contemporary realities and long-range national concerns.

The present NCERT Silver Jubilee Commemorative Volume is a compendium of twenty-five articles written by the most eminent scholars in the arena of education in India. These articles deal with some of the emerging concerns and a wide range of issues related to school education in the country.

The sequence of the articles in the volume llows an inherent thematic arrangement eginning with concept and dimensions of education followed by articles related to policy formulation, equality of educational opportunity, content and process of school education, teacher education and future perspectives. The articles provide a glimpse of the present status and future needs in respect of education in general and school education in particular. Some fresh thoughts and ideas and some impressive deductions and speculations have been presented in the articles.

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SCHOOL EDUCATION IN INDIA

Present Status and Future Needs

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Foreword

I HAVE GREAT PLEASURE IN ASSOCIATING MYSELF WITH THE PRESENT publication, *School Education in India: Present Status and Future Needs.* It is a commemorative compendium of twenty-five articles on various aspects of school education written by eminent scholars and educationists brought out on the occasion of the Silver Jubilee of the National Council of Educational Research and Training. NCERT is a national apex body entrusted with the task of bringing about qualitative improvement in school education. Its Silver Jubilee provides an appropriate occasion for the entire educational community to look back and appraise developments in the field of school education. It also augurs well that the volume is being issued at a moment when we are poised for a vigorous implementation of the National Policy on Education, 1986, keeping before us, clearly chalked-out, time-bound targets.

During the pre-independence period, education was never given its due. An important aspect of educational development in India during the past few decades, therefore, has been the continuous and sustained effort to evolve a national system of education. The setting up of the National Council of Educational Research and Training (NCERT) by the Government of India in 1961, marked a significant event in the effort to restructure education in the country and to give it an indigenous identity, reflecting the ethos and concerns of Indian society.

Over the years, NCERT has succeeded in carving out a place for itself as a highly professional body whose advice and expertise are sought both by the States and the Centre alike. In fact, it has acquired a unique status even at the international level. There are hardly any comparable counterparts in other countries. India, therefore, is in a somewhat enviable position as NCERT with its comprehensive infrastructure, has been able to make a handsome contribution in many international fora on school and teacher education.

The Council could acquire this stature over the years mainly through the evolution of a new work ethos in the arena of school education. It has worked very closely with the States and their specialised agencies dealing with different aspects of school education. In fact, it is unimaginable to think of

NCERT without a large number of agencies working in the field of education in the States and Union Territories. These are the State Institutes of Education, State Councils of Educational Research and Training, Centres of Continuing Education, Extension Centres of Education, State Institutes of Educational Research and Training, Educational Technology Cells in the States, State Textbook Bureaus or Corporations, and Boards of Secondary Education. The Council itself runs four Regional Colleges of Education and seventeen Field Offices which continuously interact with the States. The proposed District Institutes of Education and Training are only a logical corollary in this process of developing an infrastructure to promote two-way communication between the local and the national levels.

Interaction with educational functionaries at various levels and with individual teachers and their groups working under extremely diverse conditions provided the Council with deep insights. By providing a common forum and a well-thought-out agenda for the States to discuss their common problems, to share experiences and pool ideas in various regional and national meets, the Council has acted as a catalytic agent for educational reform. The States have thus gained experience and the expertise and confidence to solve their problems. This partnership has resulted in valuable contributions by the Council. The Council has also left no stone unturned in helping the States with the international experience it has acquired. It also provided opportunities to State personnel, besides its own, to benefit from interaction at the international level.

During the past two years, NCERT has played a very important role in developing a national consensus that could be given a concrete shape in terms of the National Policy on Education, 1986. Data primarily culled from the Fourth All India Educational Survey conducted by NCERT formed the backbone of the document, 'Challenge of Education'. Perhaps no other document in the history of education in India was so widely debated, not only by almost all the functionaries in the field of education but also by the general public. This extremely self-critical document provided a very realistic framework within which the thrusts of the new policy were identified and priorities determined. The Council on its own, organised quite a few national consultation meets and, to many of the rest, it deputed its senior faculty to absorb and convey faithfully to the centre the problems, difficulties, new ideas and concerns, along with the expectations and aspirations of the common people, and information on the bottlenecks that hold up progress. Thus, for the first time, a policy on education could be evolved not as a lifeless document but as a manifestation of national awakening in regard to education and the crucial role it can play in nation building, economic reconstruction and social transformation.

Education is being looked at from a wider perspective for the first time. It represents a most important input in human resource development. With this changed perspective, the duration and modalities of education have also undergone a sea change. We now consider education an integral part of a lifelong process. It cannot therefore be confined to the four walls of a classroom. It must break through these walls, as it were, and enter every activity of the society and place of work of its members. Hence there is an emphasis on the non-formal stream as an alternate system to the formal one. The task in such a case can be handled effectively through open and distance learning, provided we use modern educational technology more meaningfully and imaginatively. By implication, we are interested in being not merely a literate society but also, and essentially, an ever-learning society. This is the only way we can tackle our population problem, multiply employment opportunities and eradicate ignorance, disease, poverty and fatalism.

One of the strongest thrust of the NCERT is in the area of curriculum development. It undertook this most important task of national significance in the 1960s and continued it in the 70s and 80s. It has worked very closely with teachers who are in direct contact with the learners, pedagogists, curriculum specialists, subject experts and eminent authors in thrashing out philosophical postulates and rationale for developing curricula that would ensure national goals and perspectives on the one hand and yet would be flexible enough to adapt them to local needs and environmental conditions.

The new National Curricular Framework envisages a common scheme of studies indicating different areas of study and weightages in terms of instructional time. It also envisages minimum levels of learning for each stage of school education and for each curricular area, indicated in terms of specific learning outcomes common for all learners, irrespective of the modes of learning. This would ensure inter-state and inter-regional comparability of educational standards and also international comparability of the national system of education. The curriculum would allow for flexibility in terms of selection of content and designing learning experiences, keeping in view the local requirements, ensuring greater initiatives on the part of the teachers, the social and local authorities. The curriculum framework, besides defining the major educational objectives and common scheme of studies, also highlights certain core elements which are essential for nurturing national identity. These elements would cut across different subject areas and disciplines. A child-centred approach to education with the teacher as a facilitator in the learning process is the key to the new strategy in the transaction of the curriculum. The teaching-learning process will be directed to the total development of the child's personality. 'The National Curriculum for Primary and Secondary Education—A Framework (1986)' is the outcome of concerted efforts spread over two to three years to arrive at a national consensus through seminars and workshops organised at state, regional and national levels, where educators, educational administrators and scholars from different fields participated as equals, pooling their personal and group expertise and insights.

Curriculum development and renewal is a continuous process. It is not a linear but a cyclic process in which evaluation and impact studies, oral feedback and findings of new researches are constantly referred to in order to refine curriculum and curriculum materials. The Council has a wealth of curricular materials, starting with a national framework or philosophy, followed by guidelines to develop schemes and courses of studies or detailed syllabi, curriculum guides, teaching or resource units, handbooks, source books, teachers' materials, textbooks, workbooks, supplementary reading materials, multimedia packages consisting, besides print materials, of slides, filmstrips, audio and video tapes, educational films etc.

The Council's textbooks, which are among the most inexpensive but the best in quality, have received wide acceptance and acclaim all these years wherever they are in use. However, the Council keeps revising and improving them. Among other educational materials produced by the Council, its pioneering efforts in providing science kits, low-cost teaching aids, charts, transparencies etc. have continued apace. It has an active role in the 'INSAT for Education' project, producing educational television materials for the benefit of rural primary school students and teachers, for which the Council's Central Institute of Educational Technology has the most active role in writing, producing and capsuling television programmes in active partnership with Doordarshan and the State Institutes of Educational Technology set up with the Council's active collaboration in Andhra Pradesh, Bihar, Gujarat, Maharashtra, Orissa and Uttar Pradesh. The Council's pioneering work in the field of computers in education has provided a unique opportunity of interaction with advanced technology to many hitherto underprivileged schools. The Council realised, from the outset, that education cannot be confined to book learning alone, but must extend to real life and work. This perception is reflected in the Council's work in the field of work experience and vocationalisation.

The Council collects data, conducts research projects and disseminates knowledge and information through its journals published in Hindi and English for students, teachers and researchers.

The National Policy on Education has made a special commitment concerning identification and nurturing of talent from all sections of our society. The Council has been identifying talent through its talent search schemes for many years now. To this a new responsibility has been added through the Navodaya Vidyalayas which are going to be set up, eventually one in each district. The responsibility for developing, standarising and administering psychological tests which are culture-neutral for the purpose of locating talent in rural areas has offered a new challenge to the Council. To my mind, such an endeavour is in itself a great revolutionary step in that it shifts the emphasis in the search for talent out of the narrow confines of the priviledged classes to the wide masses of the underprivileged.

Some material for the students of Navodaya Vidyalayas has already begun to be written and produced. Once produced, however, it would not, I am sure, remain confined to the Navodaya Vidyalayas, but be quickly absorbed by other schools. In that event, the 'pace setting' function of the Navodaya Vidyalayas can be established and the Council, in turn, would register its contribution towards promoting excellence in the schools all over the country, which is its avowed goal.

There are many other areas in which the Council's contribution has been laudable. It has also been able to spread its services to many other developing nations in helping them solve their problems in training and school education. In fact, nothing involving education is foreign to the Council. Every bit of innovation elsewhere has been taken up and experimented upon with its framework.This is the sign of its becoming an agent for educational transformation in India and beyond its borders. The strength of this organisation lies in its work ethic and dynamism.

I am happly to see in the present compendium some of the eminent names in the arena of education in the country. This reveals the respect the Council has earned from scholars and educationists in the country. It also convinces me of the painstaking efforts of Dr. P.L. Malhotra, Director, NCERT, and the Sub-committee appointed by him for its compilation. I understand that, besides this compendium in Hindi and English, the Council has many more to follow during the year as part of the observance of its Silver Jubilee. I am sure such publications will provide media for exchange of ideas and the meeting of the best minds in the field of education. Since the Silver Jubilee of the Council happily coincides with the year of the National Policy on Education, these publications may well become landmarks in the history of education in India.

P.V. NARASIMHA RAO
President, NCERT
and
Minister of Human Resource Development

New Delhi
August 1986

Preface

THE SILVER JUBILEE OF THE NATIONAL COUNCIL OF EDUCATIONAL Research and Training (NCERT) marks a quarter century of active development in the history of school education in India. This occasion provides an opportunity to reflect on its past performance and to reorient its future programmes in the light of contemporary realities and long-range national concerns.

During the past 25 years of its existence, NCERT has played a significant role in formulation of policies and planning and implementation of several programmes and projects in the field of school and teacher education. The Council has emerged as one of the largest organisations engaged in research, development and training activities in the field of school education in the world. It has maintained a close liaison with the governments of all states and union territories through its Regional Colleges of Education and a network of Field Offices and by actively collaborating in implementation of programmes and projects formulated by Departments/Directorates of Education in states and union territories. The Council has also built links with many international professional institutions and UN agencies such as UNESCO, UNICEF, UNFPA and UNDP and has been the implementing agency for many of their projects.

A significant development in the field of school education during the past two decades has been professionalisation of curriculum development, syllabus design and preparation and evaluation of textbooks. The emergence of NCERT and its direct involvement in the process of curriculum development and preparation of textbooks as a nodal agency in this field at the national level gradually led to the establishment of Textbook Boards and the State Councils of Educational Research and Training (SCERTs)/State Institutes of Education (SIEs) for providing technical support to research and development activities related tor formulation of curriculum and preparation of textbooks at the state/union territory level. As a result of these developments, school textbooks in India have undergone a qualitative improvement during the past few years though there is still enough room for improvement of their quality, including that of textbooks published by NCERT and state-level agencies.

The publication of *Curriculum for the Ten-Year School—A Framework* in 1975, and Higher Secondary Education and its Vocationalisation in 1976 by NCERT gave concrete shape to the efforts for restructuring of school education and adoption of the 10 2 pattern as recommended by the Education Commission (1964-66). The publication of these documents were followed by efforts by NCERT to develop supporting syllabi and textbooks which were used as models by states and union territories.

Curriculum for the Ten-Year School provided an impetus to the teaching of environmental studies, science and mathematics as part of the general education curriculum from the primary level. The reorientation of science teaching first initiated through the introduction of the new curriculum and activity-based instructional materials developed by NCERT gradually developed into a national movement for popularising science among school children through the National Science Exhibition for Children organised evey year by NCERT on the occasion of Jawaharlal Nehru's Birth Anniversary and the state-level science exhibitions funded and coordinated by it.

The efforts for promotion of science education and cultivation of a scientific temper among children have been further intensified with the launching of a movement to set up science clubs, implementation of a scheme to identify talent in science and to support talented children through scholarships till the Ph.D. stage, and introduction of 'Computer Literacy and School Studies' (CLASS) designed to acquaint teachers and students with this versatile tool, representing advanced technology, that can be used to promote individualised learning and accelerate the pace of learning, besides providing access to information related to different fields.

The implementation of certain innovative national projects coordinated by NCERT at the national level and supported financially by UNICEF have further helped in institutionalisation of the procedures of curriculum development and preparation of instructional materials at the state/union territory level. Under these projects, efforts have been made to develop innovative approaches to early childhood education, evolve strategies for continuous renewal of the primary education curriculum to make it more relevant to life situations and environmental contexts of children, develop appropriate strategies for community education and for comprehensive access of children to primary education with built-in linkages with nutrition, health, environmental sanitation and the world of work. These projects have been widely recognised for their contribution in the field of curriculum development, teacher training and community participation in primary education, both in the formal and non-formal sectors.

The concept of vocationalisation of education and work-oriented education has received a great impetus in recent years, especially with the adoption of the 10 2 pattern of school education in states/union territories. The crucial role played by the NCERT since the late 1970s in mobilising the school authorities all over the country for introduction of work experience up to the secondary stage and introduction of vocational courses at the higher secondary stage, in orienting educational functionaries to the different aspects of work-oriented education and vocationalisation at the 2 stage have resulted in the creation of a cadre of curriculum specialists and trainers for vocationalisation of higher secondary education in a phased manner.

The professionalisation of curriculum development activities gradually brought into focus the need to link curriculum development and preparation of instructional materials with the methodology of teaching and system of evaluation. The past two decades, therefore, witnessed a variety of activities related to examination reform leading to development of objective-referenced measures. The programmes and projects related to examination research and reform carried out by NCERT, along with he conceptual materials on educational evaluation and item banks in different subject areas developed by it, gave concrete shape to the movement for examination reform in the country. This resulted in improvement in the examination practices followed by not only the Boards of Secondary/School Education but also other examining agencies like the Union Public Service Commission (UPSE), the Education Corps of Armed Forces and similar other agencies.

The renewal of school curriculum and reorientation of examination practices were accompanied by efforts to reorient the pre-service and in-service education of teachers. The pre-service teacher education curriculum was revised on the recommendations of the National Council for Teacher Education (NCTE) for which NCERT provided the organisational and R and D support. A major reorientation of the pre-service teacher training programme was brought about by the Regional College of Education which evolved a four-year integrated teacher-education programme for training secondary school teachers and a two-year M.Sc.(Ed.) course for training Higher Secondary School teachers.

More significant has been the developments in the area of in-service education of teachers. The establishment of a network of extension centres and centres of continuing education in the states/union territories and the in-service teacher training course in science for primay school teachers conducted by NCERT, using a multi-media package and by utilising the facilities provided by the Satellite Instructional Television Experiment (SITE) helped in evolving new approaches to in-srevice education of teachers. The nation-wide in-service orientation programme for five lakh teachers coordinated by NCERT and conducted with the active collaboration of the state/union territory governments during April-July 1986 was the first time such a massive programme for teachers was organised, with television-support programmes in 13 languages through 2,500 Resource Centres spread all over the country.

Another significant development that has taken place during the past few years has been the conscious and deliberate effort to untilise educational technology for promotional, motivational, instructional and training programmes for improving the quality of education. The emergence of new technological devices and new knowledge about information processing and the process of communication have generated new patterns and systems of learning. NCERT's programmes for developing innovative and low cost teaching aids and audio-visual aids since its inception and its participation in SITE and the Radio Pilot Project for teaching language conducted in Rajasthan were followed by the expansion of the educational technology network with the launching of INSAT 1-B and setting up of the Central Institute of Educational Technology (CIET) under NCERT in 1984 and State Institutes of Educational Technology (SIETs) in the States. Programmes for development of scripts, training of script writers and other media personnel conducted by CIET have created the required trained personnel for preparation of audio/video programmes for educational purposes and for carrying out all activities related to the utilisation of the INSAT 1-B system for school education.

The crucial role of education in building a society with democracy, socialism and secularism as its motto, and in developing among the people the national spirit and national identity essential for promoting national unity came to be widely recognised during the past few years. This brought in its wake a movement, spearheaded by NCERT at the national level, to undertake specific projects for promotion of ideas focussed on national integration, India's rich cultural heritage and an awareness among younger generation of the country's struggle for independence, through preparation of promotional and instructional packages including teachers' guides and audio/video cassettes. An album consisting of 80 visual panels with brief write-ups depicting the various events and landmarks relating to India's freedom struggle was brought out by NCERT in December 1985. This is being made available to teacher-training institutions and other resource centres as part of the Council's efforts to promote an awareness of India's freedom struggle among the younger generation. Steps have also been taken to include an adequate and graded coverage of the freedom struggle as an integral component of the curriculum at all stages of school education.

An important activity taken up for promotion of national integration has been the evaluation of school textbooks with a view to removing materials which impede national integration. On the basis of the guidelines evolved by NCERT in collaboration with Education Departments in states/union territories, more than 1000 textbooks in languages and history were reviewed and several of them were revised. This programme has now been institutionalised as a regular activity covering textbooks in different subject areas such as language(s) history, civics, geography, sociology etc.

Another programme directed to promote national integration has been the organisation of a series of camps coordinated by NCERT and organised in collaboration with states/union territories to train teachers in community singing of songs in 16 languages. These camps, together with the production and distribution of a multi-coloured book containing these songs in the respective language scripts as well as in Roman and Devnagri scripts, along with musical notations, have helped in institutionalising community singing in a large number of schools in the country.

The past two decades were also marked by a series of efforts to create a national data-base for policy formulation and for planning and implementation of projects and programmes in the field of school education. The All India Educational Surveys conducted by NCERT in 1968, 1973 and 1978 respectively in collaboration with states/union territories provided the primary data in respect of infrastructural facilities, enrolment and other aspects of school education. The data of these Surveys have been extensively used both in India and abroad for studying the growth pattern of the school education system in India and for formulation of five year plans and review of their implementation. The All India Educational Surveys together with the research projects conducted by NCERT and also those funded by it have helped in creating a data base for evolving schemes for improvement of physical facilities in schools, development of quality instructional materials, improvement of methodology of teaching and evaluation of procedures and methodologies to assess performance of learners, teachers, institutions etc. The Fifth Educational Survey has just been undertaken and its data will hopefully be utilised while preparing the Eighth Plan.

The Silver Jubilee of NCERT is being celebrated at a crucial stage in India's educational development. The Government of India has adopted a New Policy on Education. As a result, there is today a greater concern for education and there is a growing realisation that the future of the country depends upon the development of its human resources. A significant reorientation to the very approach to education is now taking place. Instead of visualising education as a bi-polar process between the teacher and the taught, it is being approached as a learner-centred process. A learner is no longer considered to be a mere passive receiver of knowledge but an active participant in the teaching-learning process. The entire gamut of processes of teaching-learning is being reoriented in order to develop an interactive process of learning. In this context, the teacher's role is envisaged to be more dynamic and, instead of remaining a mere delivery system, he is expected to become a manager of instruction, a designer of learning experiences and a facilitator in the process of learning. The National Curriculum for Primary and Secondary Education—A Framework prepared by NCERT (1985) in active collaboration with state agencies is a landmark in developing new methodology for an effective implementation of the strategy for curricular transaction and preparation of instructional materials.

The National Policy on Education, 1986, envisages a national system of education characterised by a common educational structure, a national curricular framework, equal opportunity to all, not only in access, but also in the conditions for success, and minimum levels of learning for different stages of education. The transformation of the educational system as envisaged in the New National Policy on Education calls for sustained efforts to improve the quality and relevance of school education. In this context, there is a need to develop greater capabilities at all levels to grapple with a variety of problems and issues that have emerged in the field of education in recent years. Some of the major concerns which have a direct bearing on the educational development in the country are universalisation of elementary education which would require adoption of strategies for widening access and reducing wastage, development of non-formal and open-learning systems as alternatives to formal schooling, renewal of curriculum and improvement of quality of instructional materials accompanied by adoption of innovative methods of instructions, improvement of evaluation practices and examinations, improvement in the quality of textbooks and other instructional materials and in the professional preparation and process of reorientation of teachers. Introduction of work education as an integral component of the school curricula, vocationalisation of higher secondary education, value orientation in education, effective use of media and educational technology for performing promotional, motivational, supportive, enriching and substitutive roles in both formal and non-formal systems of education and in teacher education are some of the areas which need special attention during the next few years.

The 25 articles in the present volume, written by some of the most eminent scholars in the field of education in India, deal with some of the emerging concerns and a wide range of issues related to school education in the country. The sequence of the articles in the volume follows an inherent thematic arrangement beginning with concept and dimensions of education followed by articles related to policy formulation, equality of educational opportunity, content and process of school education, teacher education and future perspectives. There is, however, no ordering of articles in terms of seniority of the contributors and no priorities are reflected in the sequence. The articles provide a glimpse of the present status and future needs in respect of education in general and school education in particular. Some fresh thoughts and ideas and some impressive deductions and speculations have been presented in the articles. The views expressed in the articles in this volume are essentially of the authors and not of the NCERT or Government of India. Most of these articles were written before the adoption of the National Policy on Education, 1986 However, one can see many revealing similarities between the views expressed in the articles by the individual contributors and the ideas contained in the National Policy on Education. I hope, this volume will be found useful by researchers and teachers of the country and by those abroad who are interested in the developments in school education in India.

Besides the present commemorative volume in Hindi and English, the Council is also bringing out a pictorial publication dealing with various aspects of NCERT. This will be followed by another volume containing original Hindi articles which are presently being compiled for publication during the Silver Jubilee Year of the Council. Several other publications a also proposed to be brought out by the Council in due course. I hope, the series of these publications will help in the task of rejuvenating the system of education in India and equip the country to face the challenges of the present and take it to the 21st century as a strong, united and vibrant nation.

Let me take this opportunity to express my deep sense of gratitude to some of the eminent educationists in the country who have contributed articles for publication in this volume.I am also grateful to the members of the Silver Jubilee Sub-committee for Publications for their active support in bringing out this volume. Acknowledgement is due, particularly to Professor B.S. Parakh, Chairman of the Sub-committee, and Prof. C.H.K. Misra who acted as the Convener of the Silver Jubilee Sub-committee for Publications. I also express my gratitude to the staff of the Publication Department, particularly, Sarvashri C. N. Rao, Prabhakar Dwivedi, S. K. Sharma, Benoy Banerjee, Smt. V. Shankarnarayan and Shri Mathew John for their contribution in bringing out this volume in its present form.

P.L. MALHOTRA
Director
National Council of Educational
Research and Training

New Delhi
August 1986

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V.S. JHA

Education: What It Is and What It Needs

V.S. Jha

V.S. JHA *(b. 1899) did his doctorate at London University. He held many important administrative posts including Secretary, Government of Madhya Pradesh, Vice-Chancellor, Banaras Hindu University; First Director, Commonwealth Education Liaison Unit, London; Secretary, Commonwealth Education Liaison Committee, London; Member, Education Commission of India; Member, Royal Commission for Higher Education in Sri Lanka; Member, Governing Board of Sangeet Natak Academy; Chairman, Managing Committee of Kathak-Kendra, Delhi. He is a recipient of the Padma Bhushan. He has been contributing to many professional journals.*

Education: What It Is and What It Needs

EDUCATION AND LIFE ARE INSEPARABLE AND COTERMINOUS. TO LIVE IS to undergo education. There can be no education which is life-less. Education begins with birth and continues as long as life lasts: from the cradle to the grave. Some say that it starts even before birth and continues after life has ended, but that depends on our conception of what life is. Education has no pauses as long as there is life.

The fundamental nature of the process of education also continues unchanged throughout, although, as a person matures and is called upon to operate at higher and higher conceptual levels and to cope with ever new and complex situations, he has to adopt highly sophisticated techniques of learning. The conventional division of education according to stages—primary, secondary, university and the rest—is a matter of convenience and largely reflects changes in emphasis on one of the aspects of learning or another. The primary stage is more concerned with the tools of learning, acquisition of the skills of learning, cultivation of habits of body and attitudes of mind necessary for efficient acquisition of knowledge, formation of sound judgments, and skilled performance of tasks which have to be done. At a later stage, there may be greater emphasis on understanding of relations between abstract concepts and other refined intellectual processes. But education continues right through life; in schools and outside, in waking life and in sleep.

Education is, in a way, like music in which two distinguishable notes keep sounding and, as they alternate in varying rhythm, reflect how the powers potential in a person grow—powers of the body and mind, of intellect and imagination, of creativity and intuition. Education begins with wonder: a thrill of the mysterious, when mind encounters some strange phenomenon. Native urges of curiosity drive the mind, often romantically, to unravel the mystery of the unknown. There is a little of the poet in every human being who, like the lunatic, lover and poet of Shakespeare, scans the wonderful creation around him with his eyes in "fine frenzy rolling". Whose heart does not leap when he beholds the stars meandering majestically across the heavens in the darkness of the night? Or when he beholds the endless and vain rolling of the blue ocean? Or the opening of the dew-washed petals of a flowerbud to greet the rising sun? The mind does not merely "watch and receive" as Wordsworth would say. It sees more than meets the eye—castles in the rolling clouds; the eight-horse-driven coach of Prince Charming in a pumpkin. He also experiences awe when he sees sorrow and death and he wonders: Why? He feels within himself the urge as well as the power to find answers. He delights in his freedom to think, to imagine, to understand, and to have visions. If he tries, he can perceive relatedness in the apparently unrelated world around him. If he has the will, he can also create things of immortal value.

The second note in the rhythm of education is somewhat sterner, it requires discipline and control of the self within. Things must be known as they are, not as what the mind makes of them. The learner cautiously tries to observe things with a critical eye, to search for meaning, and to understand in order to be able to explain what is really happening around him. He toys with things around him, arranges and rearranges the phenomena of his interest and manipulates them to make them yield the secret of their behaviour. He learns that all knowledge is tentative; but his inborn restlessness and discontent allow him no option but to press the enquiry further and further. His is the joy of the hunt not of the kill. The harder the probe, the greater the thrill. Poet Frost called it the "fascination of the difficult". Self-discipline, self-searching, and self-integrity underlie man's rational thinking, his judgments and understanding of life.

Freedom of imagination and self-control; dissent and discipline take turns and appear in myriad forms in the play of education. They constitute the very essence of the process of education which can be summed as the art of management of dissent. Dissent loses its fire when blind; but if pressed with discipline, can open up new realms of knowledge and of action. The spirit of romance and the rigour of discipline, both, must be kept alive in a fine balance lest one should destroy the other. Wordsworth complained that "we murder to dissect". What is essential in education is to stimulate and keep alive the sense of wonder, the thrill of mystery, without which both life and learning are dull, and at the same time, to subject the self-within to rigorous discipline in the pursuit of truth.

Education is education of the pupil: the individual. This is a truism so self-evident that its implications in the process of education remain unnoticed. In the system of education importance is given to curriculum, to content of courses in various subjects, to the teacher, to the school and its management, to textbooks, to examinations and the rest. These are all important factors in the organisation of education; but it is essential not to forget that the individual pupil is the centre of all learning: it is his individual education with which we are primarily concerned. Frost observed that only the freeborn can realise and act upon the assumption that all learning is individual. Those who prepare and prescribe curriculum would have us believe that they are the key factor in education and determine what education is and its quality. In their anxiety to modernise courses of instruction they keep loading the syllabus with new concepts in each subject without cutting out the deadwood in it. They are subject-centred and often unconcerned with the interests and capacities of the pupil. Programmes of instruction have undoubted value; but what is far more important is how the pupil learns and how he exercises the powers of his mind, how he understands, and how he forms his judgments. The teacher, in his turn, is an important factor and his claim to shouldering the major responsibility for the education of the pupil cannot be disputed. But the process of education takes place even when there is no formal teacher. The world outside, the home, parents, the streets, picture-houses, TV, and all that each individual sees and hears, and all that he has to do, constitute his education; often bad education. The teacher's role is to ensure that what a pupil learns is good and useful to him and that he learns by using the powers of his mind skilfully and efficiently. The teacher guides the pupil by his skill in the art of teaching and, what is far more important, by the example of his personal life and by his habits of living, thinking and working. He inspires the pupil to use his native powers and capacities: powers of the body and mind, imagination and intuition, understanding and creativity. He trains the pupil to use his powers well and wisely for self-refinement as well as for the good of those with whom it is his lot to live. Ultimately, however, the education of each individual pupil is what he makes of it through his own effort.

Three native urges underlie the growth of a person from childhood to adolescence and to youth. They are significant to his education. The first is the urge to be free. Freedom is a continuous initiative from within to fullness and harmony; to aspiration and creativeness; in a word, to self-realisation. A little bird, soon after it is hatched, begins to test its wings; later it flies and then it soars: blythe spirit! It builds a nest of its own. Similarly, perhaps more slowly, a child tends to free itself from the apronstrings of his mother and, in course of time, to break away from her. He strives to build his own economic and social destiny. But he soon realises that there are more bonds that bind him than he perceives and they hold him in various ways, unobstrusively, but none the less firmly. For example, knowledge of the outer world comes from his senses which are rooted in the flesh which binds and also blinds him. He is unsure of the reality of what he perceives. Later, he finds reasons to distrust words which are valuable means to gain knowledge. There is much truth in Ludwig Wittgenstien's observation that words are cheats and there is good reason to be on guard against the bewitchment of intellect by language. He, if he is sensitive, begins to feel that he is in a prison and every circumstance throws rings around him and screen him from knowledge. However, the human spirit is defiant in its struggle for emancipation and strains to experience what lies beyond the realm of the senses, of reason and of language. His quest is beautifully described in the inimitable words of *Taittiriyopanishad:*

यतो वाचो निवर्तन्ते अप्राप्य मनसा सह ।

[(that world) from which speech along with the mind return without entering it—unfulfilled.]

The human spirit endeavours to transcend all its limitations to experience a moment of boundlessness. This spirit underlies the ancient concept of education in India: सा विद्या या विमुक्तये : that is education which emancipates. The same impulse is described by an Urdu poet:

हदे हस्ती बहुत कुछ नेस्ती तक खेंच लाया हूँ।
मिला दूंगा किसी दिन देखना मंजिल को मंजिल से।।

The poet claims that in his fancy's flight he has stretched the boundaries of existence very close to the boundaries of non-existence. May be some day he will dissolve the boundaries which appear to separate existence from non-existence!

The second urge is closely related to the first. The growing adolescent experiences within his body and mind some vague and deep stirrings which are the beginnings of the impulse to find a mate. This urge opens for him the realm of fancy and drives him to go beyond himself to discover himself. Management of this urge, what the ancients in our country called *brahmacharya* (ब्रह्मचर्य) gives character and colour to the personality of the individual and in the end determines for him the values of his social life. According to Sigmund Freud, human civilisation is based on the permanent sublimation of human instincts. Professor Herbert Marcuse observed that "Methodical sacrifice of the libido, its rightly enforced deflection to socially useful activities and expressions is culture." One cannot be a human being without cultural experience. Some fortunate persons have been able, through self-discipline, to transcend themselves and experience love of the kind and at the level which is best described by the mystic poet Kabir in his immortal couplet:

जब मैं था तब हरि नहीं
अब हरि हैं मैं नाहिं।
प्रेम गली अति सांकरी
ता में दो न समाहिं।।

[When I was there, God was not, now God is there, I am not. The lane of love is much too narrow to admit two: 'I' and 'you'.] To get into the lane together I should shed my 'I'ness and you, your 'I'ness. I and you must merge into one another and become indistinguishable.

Poet Tulsidas refers to his experience of his 'knowledge' of God. Knowledge has limitations and God is assumed to be infinite and limitless. How can the limited grasp the unlimited? Tulsi says:

सोइ जानइ जेहि देहु जनाई
जानत तुम्हहिं तुम्हहिं होइ जाई।

[All knowledge comes from Thee: Knowing Thee I become Thee.] Tulsi's intuitive experience and power of vision enable him to transcend the limitations to which the flesh is heir. German poet Schiller visualised the liberating role of the play impulse as that of "abolishing time in time". An aesthetic state which is a state of liberation enables transcendence.

The third fundamental urge inherent in a growing person is the urge to fashion for himself a philosophy of life, viz. his understanding of himself as well as of his environment in which he will have to live and his conscious effort in the shaping of his attitudes which will reflect his sense of values and determine his decisions. He must learn to appreciate how parts are related to the whole and how to value each part as it is in itself and in its relation to the whole. He must also have visions, as poet Blake puts it:

To see a World in a Grain of Sand
And Heaven in a Wild Flower
Hold Infinity in the palm of your Hand
And Eternity in an Hour.

In the same strain, Emerson observed: "He crowds eternity into an hour and stretches an hour to eternity." For Heisenberg, it is a search to discover a principle of differentiation and yet of relationship lucid enough to justify and purify scientific, philosophic and other knowledge, both discursive and intuitive, by accepting their interdependence. He considered this attitude to be the result of crisis made articulate by science, viz. a new awakening in the midst of flux. Watching change and being in it. Niels Bohr described the idea aptly when he said, "We are both actors and spectators in the universe".

The function of education is to help the pupil to carve out for himself a philosophy of life by which he must live. He needs to have a vision of his destiny and a clear view of the role he must play in life. A man is known by what he aspires to be; what he loves and cares for; and the image with which he identifies himself. It is necessary to appreciate that a philosophy of life can be a very wicked one. It is still more essential to appreciate that if a person does not take the trouble of undertaking the hard—perhaps the hardest—task of evolving a philosophy of life for himself through his own effort, there are in modern life forces at large that would readily do it for him. There can be no philosophical vacuum: fashionable political dogmas, newspapers, TV, radio, and commercial advertisements will make all choices for him and fashion his attitudes in life and determine his decisions. Professor Marcuse very relevantly observes:

> The modes of domination have changed: they have become increasingly technological and productive, and even beneficial; consequently, in the most advanced areas of industrial society, the people have been coordinated and reconciled with the system of domination to an unprecedented degree!

Even in the circumstances of modern life described by Professor Marcuse, there is no room for despair, if education in the proper sense is allowed to play its role, viz. to awaken the pupil to an appreciation of his freedom and responsibility in making choices in accordance with his own philosophy of life. But that is the harder way of life; also the nobler. It demands unceasing examination and re-examination of one's beliefs and opinions in the light of new experience and subjecting them to scrutiny to keep them ever bright and burning.

A person's philosophy of life and his value-system are reflected in his life-style; in the way he thinks, speaks, moves and works—in his minutest behaviour. The more disciplined ones order their life according to their thoughts and to the values by which they stand and thus they cultivate studiously and skilfully a style of their own—which according to Whitehead is "the highest morality of the mind" and the most austere of mental qualities. According to him, style is an aesthetic sense based upon admiration of direct achievement of a foreseen end simply and without waste. Grace lies in performance of a task—mental or physical—with perfection, with minimum effort and with aesthetic finish. The style is the man. The Gita says: यो यच्छ्रद्धः स एव सः । —[A man is what his श्रद्धा is]: श्रद्धा *(Shradha)* is a difficult word to translate: it means one's commitment to beliefs and values with which one identifies oneself.

In this context it would be of interest to digress, to recall questions which, according to the Gita, Arjun, the ideal student, put to Krishna, the ideal teacher, regarding the qualities of स्थित प्रज्ञ and समाधिस्थ, the wise one who is perfectly self-controlled.

स्थितप्रज्ञस्य का भाषा समाधिस्थस्य केशव ।
स्थितधीः किं प्रभाषेत किमासीत् व्रजेत किम् ।।

[What kind of language does the wise one use? What is the manner of his speech? How does he sit down? How does he walk?] The enquiry relates to the style of functioning of a person who has attained perfection and whose actions reflect the qualities of his mind. I am also tempted to recall an old Hindi couplet which to me is significant:

मुख श्रवण दृक नासिका सब ही के एक ठौर ।
हँसिबो, सुनिबो बोलिबो चतुरन को कछु और ।।

[In the face of every man the mouth, the ears, the nose are located at their respective places. But the way the wise one laughs, listens and speaks is very different from the rest.] The *chatur*, the wise one, is known by his style.

Education fails if it does not help the individual to cultivate the hardest of all hard arts—the art of life, viz. the art of self-determination inspired and guided by elevated thoughts, humane values and refined tastes.

Let us turn to enquire what a person carries home after he has had his education. What belongs to him and endures with him? It is certainly not the knowledge of facts and information which he has learnt during his studies in different subjects. Knowledge keeps growing and what one learns today—in physics and chemistry, zoology and botany, economics and psychology—becomes obsolete in course of time. The French essayist, Montaigne, put it beautifully: "I will rather fashion my mind than furnish it." I have already referred to the opportunity a man has during his education of making himself and architecturing his mind and manner according to his vision of himself. It is interesting to recall in this context the question which the teacher Krishna put to the disciple Arjun after his course of education was completed:

कच्चिदेतच्छ्रुतं पार्थ त्वयैकाग्रेण चेतसा ।
कच्चिदज्ञान सम्मोहः प्रणष्टस्ते धनंजय ।।

Shri Krishna asks: [Arjun! You have heard me with rapt attention. Tell me what attachments—to views and values—to which you were attached due to ignorance—have been destroyed (as the result of your education)?] Arjun's answer is worth pondering over. He says:

नष्टो मोहः स्मृतिर्लब्धा त्वत्प्रसादान्मयाच्युत ।
स्थितोऽस्मि गतसंदेहः करिष्ये वचनं तव ।।

[Thanks to your favour, Krishna, my attachments made due to ignorance and illusion are now destroyed. I now know myself; I am firm in respect of what I consider to be true and just; I have no doubts left in my mind. I shall abide by thy words.] In brief, Arjun has no knowledge or views which are untested and unscrutinised. He is free from doubts and firm in respect of his concepts of truth and virtue.

But a question arises. What does Arjun mean by ending up by assuring Krishna that he will carry out faithfully Krishna's bidding? How can the mind of Arjun, liberated by instruction by a great master, still entertain the wish to conform blindly to his master's teaching rather than to think out for himself his own course of action? It is fair to recall the words of Krishna to which Arjun refers in order to keep the record straight. According to the ancient traditions, the teacher was required to give अनुशासन—some directive principles—to guide the life and thinking of the pupil and this was done by Krishna in an earlier couplet which I quote:

इति ते ज्ञानमाख्यातं गुह्ययाद्गुह्ययतरं मया ।
विमृश्वैतदशेषेण यथेच्छसि तथा कुरु ।।

Shri Krishna observes: [I have talked to you on the most profound among the profound themes. (Your education now has ended and now I prescribe for you the following code of conduct): 1. Think over (again and again) what I have said and examine it without leaving out any point of view. 2. (After you have done so) you are free to do what you consider best.]

The first of the directives given by Krishna to Arjun relates to two main characteristics of an educated mind, viz. detachment and humility. Arjun is asked to respect and give fair and thoughtful consideration to all points of view other than his own and try to understand truth as others see it. I recall an impassioned observation made by Oliver Cromwell: "I beseech you in the bowels of Christ, think it possible you may be mistaken." The chief characteristic of a trained intellect is its humility. The ancients in India used to say: विद्याददातिविनयं — [Knowledge begets humility]. Arrogance is associated with dogmatic beliefs.

The second directive given by Krishna is a charter of freedom to a trained mind to pursue truth wherever it leads and to express it as he sees it. Freedom to speak and act in accordance with one's conception of truth is also associated with a state of mind which is free from fear: अभय —*(abhaya)* meaning, where there can be no fear. Tagore in *Gitanjali* dreamt of the heaven of freedom in which "the mind is without fear and the head is held high". Fear is associated with ignorance and there is no happiness where there is fear. It may be permissible in this context to recall the old Indian way of thinking according to which true liberty is attained by self-discipline directed to the conquest by the mind particularly of the six enemies which tend to govern it, viz. काम (desire), क्रोध (anger), लोभ (greed), मोह (attachment), मद (intemperance), and मत्सर (covetousness and jealously).

No convocation address could be more elevating and more pertinent to the true spirit of education than what is contained in the directive given by Krishna to Arjun. Arjun's offer to abide by the final command of his master was not an act of abject conformism. On the contrary, Arjun's words express his commitment to the real spirit of education.

Another equally essential and enduring gain of education was considered to be विवेक *(vivek)*—skill in discriminating and forming sophisticated and dispassionate judgments. *Vivek* covers the entire realm of thought and action and all fields of knowledge—scientific, philosophical, and the rest. *Vivek* or discrimination is required in day-to-day practical life. An educated person will resist being pushed about; he guards his freedom to take his own decisions and act accordingly. Ancient mythology in India gives ample illustrations to show that a man falls when he loses *vivek*. *Vivek* helps to keep the spirit of enquiry alive.

Yet another distinguishing characteristic of an educated mind is what the ancients in India called समत्व भाव — a commitment to equality of all. Equality was considered to be native to the dignity of man. It is in essence an ethical quality far more real and profound than the popular political principle of equality conveyed by the saying: one man one vote. A man's freedom and even his control over himself presupposes his regard for the equality of all human beings. There are two concepts in the *Ishopanishad* that merit quotation:

यस्तु सर्वाणि भूतान्यात्मन्येवानुपश्यति ।
सर्वभूतेषु चात्मानं ततो न विजुगुप्सते ।।

यस्मिन् सर्वाणि भूतान्यात्मैवाभूद् विजानतः ।
तत्र को मोहः कः शोक एकत्वमनुपश्यतः ।।

The essence of the two concepts is summed up thus: [He who has learnt to regard other beings in the same way as he regards himself cannot hate any one. He who has true knowledge and has experienced sameness with other beings can have no attachment, no sorrow.]

Good education enables a person to understand other men, their thinking and actions. Proper understanding demands, as a precondition, recognition of equality. According to the Bhagwat Gita, what distinguishes a cultured mind is that it is a समदर्शी, that it sees all as equal, whether they are of "low caste or dogs" (शुनि चैव श्वपाके च पंडिताः समदर्शिन).

Like all abstract ethical concepts, understanding of the concept of equality requires critical discrimination in determining its scope and levels lest it should be understood in the vulgar sense of what is merely egalitarian and levelling up with all merits, going down to the lowest common factor. Love for an easy life and weakening of the moral fibre in the social fabric often result in crystallisation of the otherwise unexceptionable principle of equality of all men, as expressed in the political axiom: one man one vote, into dictatorship, which is accepted as convenient in spite of its ethical ugliness.

The last but not the least important gain which is expected of good education, in accordance with the Indian tradition, is cultivation of a clear view of one's own *dharma* (धर्मः). I know of no equivalent of the term *dharma* in English, but I am certain about one thing, namely, that the term does not mean, as it is popularly understood to mean, 'creed' or 'religion'. The term *dharma* connotes many things at the same time, including eternal laws, justice, duty, practical morality and sometimes even custom. Literally it means what holds in the midst of change (धारयति इति धर्मः). *Dharma* is the effort of the individual to reach out to the central order of things and events whose existence seems to be beyond doubt. *Dharma* is essential to keep the entire society together. Each individual must work out for himself his own concept of *dharma* and his commitment to his inner self as well as to the world outside. This is a necessary part of his education because it determines what he is expected to do in life in view of his personal attainments and his position. According to Mahamahopadhyaya Dr Kane, "Dharma was a mode of life which regulated man's work and activities as a member of the society in order to bring about the gradual development of man and enable him to reach what was deemed to be the goal of human existence." *Dharma* is a comprehensive theory which welds together principles of ethical, social, political and economic life. A person guided by his concept of *dharma* will be incapable of double standards in private and public life, in personal and commercial dealings. In popular language, the noblest expression of *dharma* is दया *(daya)*, compassion, and of तपस् *(tapas)* or self-purification, and क्षमा *(kshama)*, forgiveness. In essence *dharma* is one's concept of one's duty. It determines how one plays one's game in life.

I shall refrain from talking at length about what is expected of a teacher. My views on this subject are embodied in an article published through the courtesy of Shri Kireet Joshi in a recent publication of the Ministry of Education. But I will do poor justice to my theme if I do not refer to the quality that makes a great teacher. I can do no better than to recall two instances of great teachers with which Lord Snow opened one of his rectorial addresses at the University of Aberdeen. Both instances are of professsors at Cambridge, Lord Snow's own university, and illustrate why a great university is great.

The first story relates to a very distinguished Professor of Mathematics at Cambridge many years ago. I am sorry I forget his name; but in his time he was considered to be one of the tallest in his field of study. One day he surprised the University by sending a letter to his Vice-Chancellor offering to resign from the proud chair which he held. But his offer was subject to one condition, namely, that his resignation should be accepted only if one of his undergraduate students was appointed to hold his chair in his place. He considered his own young pupil a worthier mathematician than himself. The world has since known the name of the pupil: Sir Isaac Newton.

The second anecdote relates to more recent times, to Professor Hardy of Cambridge University. When he was first presented some manuscripts containing the mathematical work of an unknown mathematician he summarily rejected them as meaningless. But he kept wondering how a person could write nonsense with the consistency the manuscripts displayed. He reviewed the papers again and scrutinised them more closely. And he discovered a mathematical genius—Ramanujam. So great was Professor Hardy's admiration for his new find that he devoted himself to teaching Ramanujam—who was an untutored genius—the language of modern mathematics and translating Ramanujam's formulae into the modern mathematical idiom for the benefit of contemporary mathematicians. But for Professor Hardy, Ramanujam would have ended his life as one of the many clerks who enter government offices and pass out of them, unknown and unsung.

The two great professors were great because they had the magnanimity to see greatness where it was least suspected. Magnanimity to sense greatness in others makes great teachers and great universities.

No teacher and no university can be greater than the society will allow them to be. Political bosses and bureaucrats, who rule the society in the name of democracy, are more concerned with accumulation of power and positions of authority and are insensitive to the role of the teacher and of educational institutions, like the university, in shaping the future of the race. They show scant respect to the teacher and use him as if he were a mere tool for purposes other than education. In this context, it is refreshing to remind ourselves of the position which the teacher was allowed in the past in our country, some time early in 1000 A.D. I refer to the account given by a Tibetan vistor, Nagtshe, of an assembly in the ancient university at Vikramshila. Nagtshe attended a congregation there at which more than 8000 *bhikshus* (scholar monks) were present. The first to enter was Vidya Kokila who was to preside over the assembly. The more distinguished monks were given reserved seats. The Raja of Vikramshila (King of Magadh and the one who maintained the university by providing funds and other means) was given an exalted seat. But none of the monks, old or young, rose from their seats to mark his arrival. But all monks and the King rose from their seats when the learned Vir Vajra entered. The King showed no embarrassment at the bahaviour of the assembly. This was not a solitary instance of the kind. In accordance with the noble traditions of the country, learning was prized above all and the rulers who maintained scholars and universities, showed a humility which added to their dignity. Great teachers appear only in a refined and enlightened society: they cannot blossom in an authoritarian society. Matthew Arnold gave a beautiful picture of his great teachers:

> Rigorous teachers seized my youth,
> And purged my faith and trimmed its fires,
> Showed me the high white star of truth,
> And there made me gaze and there aspire.

The big question I have in mind is: Can our ruling classes dare to suffer such teachers? It is only great societies that create great teachers and great teachers create great societies. Small minds go ill with the noble traditions exemplified by Vikramshila.

I have rolled through fifty years working in almost all fields of education: primary, secondary, university, professional and technical. I have been a teacher, an inspector of schools, a director of public instruction, a secretary to government, and I have been involved in the making and implementation of educational policies in the country. I have almost become a weather-watcher in the world of education and I would like to share with my fellow educationists what I believe in the light of my experience, ails education and what crucial measures appear to me to be imperative. I shall be very brief.

The first step should be to initiate measures necessary to depoliticise education and to protect it from the machinations of politicians and bureaucrats. Their influence cannot be totally eliminated, but it must be considerably reduced and channelled to better purposes. The present state is sad and inclement for education in our country. Just consider, for example, the number of transfers of teachers which take place in government schools and colleges in the states, most of them to please local MLAs and those who hold positions in parties in power. The transfers of which I have personal knowledge are absurd. I know, for example that, under pressure, in one school, a good chemistry teacher, loved by his pupils, was transferred and, in his place, a teacher qualified to teach economics was posted, again to oblige some busybody. Transfers are made for gaining power and for profit.

The time has come when education should be entrusted to statutory autonomous bodies consisting of able and experienced persons whose credibility is above suspicion. The experience of the working of the University Grants Commission, which has acted as a buffer between government and educational institutions, shows how educational administration can minimise undesirable pressures. It is necessary to have such autonomous bodies for viable regions, not necessarily linguistic. The jurisdiction of the regions of the autonomous bodies should cut across the boundaries of the linguistic states so as to free education from the ugly chauvinism arising out of the creation of linguistic states. Everything possible should be done to give education a humane character and national significance. There are many thinkers who would wish it to have a national importance as well as involvement of local communities directly concerned with the institutions.

The second measure which I commend for consideration relates to recruitment of the teacher which should be made on the criterion of merit, and merit alone, as determined in a national or region based competitive examination held periodically by a competent examination body specially created for the purpose. Merit-based selection should be followed by an adequate period of probation during which the candidate should be trained and his personal commitment to teaching tested. It is equally necessary to weed out as early as possible those whose heart is not in the profession and help them to get jobs in which they will find satisfaction. An incompetent teacher who finds no joy in his profession is a drag and spells disaster for the schools and generations of pupils who enter it. Schools and universities are no asylums for mediocrity. In a recent Report of the Bihar University Enquiry Commission, of which I happened to be the Chairman, it is recommended that the first recruitment of a lecturer in a university or a college, government or otherwise, should be made on merit determined by a competitive examination held by an independent statutory body functioning at the state level. The proposal has been well received by educationists.

The third important measure necessary is the creation of an independent inspectorate—something akin to Her Majesty's Inspectors of Schools in UK—for guiding, supervising and reporting on the standards of education, the implementation of educational policies and the state of educational institutions at all levels. In the conditions which prevail today, even people who are called upon to make important decisions do not know the real state of education in the far-flung areas of the country. The country and Parliament have a right to get information on the actual state of education in the country from a competent, unbiased agency which has the freedom to report without fear. I know from personal experience of the appalling waste of resources and energy on education which is of bad quality. Instead of being fed on statistics and formal, colourless reports, the country needs to be told of the reality. Bad education is no substitute for 'no-education'. The inspectors visualised should not be a part of the machinery of government. They should be more closely associated with the autonomous bodies proposed earlier and allowed full freedom to find out and to report fearlessly on their findings.

Lastly, I think that we should have the courage to admit that our leadership has rejected Mahatma Gandhi's concept of Basic Education light-heartedly, without even a fair trial. We were much too bedazzled by the British models of educational institutions and attitudes to give any thought to their viability and relevance in the conditions obtaining in the Indian society which differ totally from those in Britain, which could boast of ruling over a vast empire and of affluence which comes of industrial development. Our ruling elite had accepted English as its language. Language never comes alone: it comes with a culture which fashions our mind and determines attitudes which are hard to give up. Mahatma Gandhi had the courage to struggle alone to make Indian education Indian in spirit and to orient it with due regard to the imperatives of the social, economic and cultural life as it existed in the vast backward rural and agricultural areas of the country. He advocated that hard, productive, manual work should be at the centre of educational activity, which should provide the inspiring source of development of knowledge, of skills of body and thinking necessary for life and cultivation of attitudes which reflect the best in the ancient cultural traditions of the country. Some serious thinkers are becoming growingly conscious of how the system of education has widened the gaps which divide the educated and the masses of illiterate people and how the educated are able to exploit the rest. The Education Commission of India did think on these lines but went only to the extent of suggesting provision in schools of 'work experience' as an expression of half-hearted acceptance of Mahatma Gandhi's philosophy of education. It is now time to rethink and redefine the concept of Basic Education in the light of the development of the new technology and new awakening in the country as a result of social and economic developments. The system of education should be redesigned to inculcate a culture of hard work and to encourage learning by doing. Mahatmaji was impressed by the spirit of the Benedictine monks who believed in the trinity of knowledge, hard work and moral energy. In the circumstances of life today it is unthinkable that most of the schools will be supplied with all the resources they need for functioning efficiently. However, all schools have human resources—the energy of the young pupils, abundant leisure and the leadership of teachers. If given the opportunity, the schools can wisely link learning with production. For example, consider for a moment the costly machines in the workshop of engineering colleges which are used mostly for demonstration purposes during certain periods in a week. There is no reason why the youthful energy of students should not be utilised for full utilisation of the available machinery for production of materials needed for the college. The new policy in education should aim to develop the innovative and creative activities necessary for cultivating love for hard work and, incidentally producing some of the resources needed for improving the quality of education in educational institutions.

No reform in education will be effective if the country does not take care to restore the status and dignity which must come to the teacher because of his responsibility in shaping the future of the race which confronts him in the classroom. It must also be realised that no teacher can take his status in the society for granted: he must earn it through his work, character and his commitment to his responsibility. A teacher with grouses, hanging around local leaders for petty favours, makes a sorry picture. A teacher is certainly entitled to certain minimum needs—simple but comfortable accommodation, access to books and magazines, an opportunity to keep improving his professional competence, and all that he needs to maintain himself and his family in reasonable comfort. A good teacher is the conscience of the society. His detachment should enable him to read the writing on the wall and to see whither the society is heading. He, if he has it in him, can be a sober and dispassionate critic of society's acts and tastes. Shelley talked of poets as "unacknowledged legislators of the world." He was right. However, the teacher is more directly responsible for giving character and purpose to the new order which will replace the present. In the long run, it would pay to trust him.

The effectiveness of a teacher depends upon the kind of relationship he develops with his pupils. In this context I am reminded of a beautiful prayer, *Shanti Paath*, 'Prayer for Peace', which opens the *Taittiriya Upanishad*. It is a prayer jointly recited by teachers and pupils together. It is a beautiful prayer and permit me to quote it:

हरिः ऊँ। सह नाववतु
सह नौ भुनक्तु।
सह वीर्यं करवावहै।
तेजस्विनावधीतमस्तु।
मा विद्विषावहे।

[O God! Protect us both (teacher and pupil) together!
Bring us up so that we grow together (into fullness)
Let us together perform great acts requiring strength and virility!
Let our learning help us to illumine (remove ignorance)!
Let us never hate each other!]

Education is a joint venture of the teacher and the taught; if either of them fails there will be no learning; no light.

D. S. KOTHARI

Education and Values

D.S. Kothari

D.S. KOTHARI *(b. 1906), an eminent scholar, did his doctorate at Cambridge University. A distinguished scientist, he is known for his remarkable work in the field of astrophysics. He was the Chairman of the Education Commission (1964-66) and of the University Grants Commission. He was the General President of the Indian National Science Academy and the Scientific Adviser to the Ministry of Defence, Government of India. He was awarded the Padma Bhushan in 1962 and the Padma Vibhushan in 1973. At present he is the Chancellor of Jawaharlal Nehru University, New Delhi. Recently, he has been honoured by Unesco for his "distinguished contribution to Unesco objectives and activities." His book,* Nuclear Explosions and Their Effects *written jointly with the renowned nuclear physicist, the late H.J. Bhabha, is regarded as a valuable contribution to the subject and has been translated into German, Russian and Japanese.*

Education and Values

IT IS WIDELY RECOGNISED THAT EDUCATION, ADEQUATE IN QUALITY AND scale, is today the most powerful instrument for national development, welfare and security. The instrument must of course be wisely used. Education is such a potent instrument that bad education is not only bad in itself but it can do great harm, lasting harm.

Perhaps the single most important characteristic of our times is that for the first time in man's history the world has become knowledge-based, largely science- and technology-based. This gives to education a role and significance as never before in history. The growth rate of science and technology, globally speaking, is extraordinarily fast—almost unbelievably fast. The doubling period, as it is called, is about ten to fifteen years. This means that the growth in science and technology, that is, the new discoveries and developments in the next ten years or so would be about equal in volume to the knowledge that mankind has gathered over the preceding several centuries.

A knowledge-based world and a certain measure of unpredictability are inseparable. The new knowledge which will be discovered, acquired, tomorrow is unknown today. If it were known *today* it would not be *new* knowledge *tomorrow*. There would be no advancement of knowledge. *A knowledge-based world is an 'open world'*. The past experience and 'models' are in general of not much avail in dealing with the problems and challenges in a rapidly changing uncertain world. Mankind has to get accustomed to living in a world which in some essential respects is uncertain. It is a far more challenging world, and there are greater opportunities for creativity in every sphere of life. New dimensions and levels of achievement and creativity are opening up. Think of the electronics revolution—automation, artificial intelligence, personal computers, and what not. In a few years education, by and large, of *artificial intelligence* devices is likely to be commonplace. The new developments are certain to have a profound impact and, in a certain sense, even greater than that of the invention of the printing press five centuries ago. And we have to be prepared for it; and in some measure it has to be reflected even in our current thinking.

Our times represent a period of transition from the industrial age to a New Age; and the transition is perhaps the most dangerous ever faced by mankind.

Nuclear bombs with an explosive power exceeding a million Hiroshima bombs are ready for instant deployment. Today for the first time man is facing a situation where there is a far from negligible probability of *total annihilation.* At this supremely dangerous time in human history *education and survival, not to mention progress, literally go together.*

* * * * * *

At this point we may remind ourselves of Einstein's profound words: "One lesson I have learnt in a long life. All our science measured against reality is primitive and childlike; yet it is the most precious thing we have." Therefore, while it is imperative that modern education should give an important place, and in a sense a central place, to science and technology, we must remember that in some essential respects science and technology have severe limitations. To ignore these limitations would be fatal to the progress of society and even its survival. Niels Bohr used to say that to be merely 'logical' is not really 'thinking'. 'Thinking' must contain something of creativity, going beyond logic and the rigid chain of causality. To be only *logical* means that the next step is contained in the first one. There is no element of creativity, no novelty. To 'think' is to be something more than to be merely logical. And this is important when we consider the question of overcoming the present soul-killing barriers between science and humanism, between knowledge and wisdom. To achieve this is not at all easy.

But the barriers between science and humanism have to be overcome, otherwise what happens is that we produce 'experts', not 'educated human beings'. And what is an 'expert'? The greatest expert is all knowledge and no wisdom. Knowledge without wisdom or ethical-moral values degenerates into arrogance and is of little avail to the individual or benefit to the community. In overcoming barriers between science and values there must be no compromise whatsoever as regards the objectivity and autonomy of science. That makes the task one of uncommon difficulty. We must not be over-ambitious. Fortunately, current developments of the greatest significance in both physical and biological sciences are opening up totally unexpected possibilities for making a start toward overcoming the rigid Cartesian partition between science and values. Let me give two brief quotations.

R.W. Sperry, in his recent Nobel Prize address, on 'Some Effects of Disconnecting the Cerebral Hemispheres', has lucidly expounded the viewpoint in which the scientific and the humanistic views of man and the world are no longer in opposition. He concludes: "A unifying new interpretative framework emerges with far-reaching impact not only for science but for those ultimate value-belief guidelines by which mankind has tried to live and find meaning".

In an oft-quoted statement (1951) Erwin Schroedinger says:

> I consider science an integrating part of our endeavour to answer the one great philosophical question which embraces all others, the one that

> Plotinus expressed by his brief: "Who are we?" And more than that: I consider this not one of the tasks, but *the* task of science, the only one that really counts.

Science, perhaps unexpectedly, is now slowly but steadfastly moving towards a more unified world view which includes *both* knowledge and values as complementary and mutually reinforcing. We are gradually moving away from what is "one of the most firmly entrenched taboos of twentieth century science" that "any mingling of knowledge with values is unlawful, forbidden". When science and values *(ahimsa)* go together the way lies open to a world of continuing achievement and enrichment of liberty, justice, prosperity, and joy for *all.* And where else could one hope for a serious beginning in that direction than in the land of the Buddha, of Mahatma Gandhi. It is hardly necessary to say that the barriers between science and values cannot be demolished by going back to ancient times. At that time science in the modern sense did not exist. Science was primitive though philosophy was highly advanced, mature. Modern science is rooted in *Planck's constant,* discovered in the year 1900. *The task of linking mature science and mature philosophy is a task of the present times, and more so of the future.* We have to make use of the new, radical ideas in pure mathematics, in physics and in neuroscience and other disciplines.

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Let us ask what would be a meaningful 'coordinate frame' for education today. What basic principles or 'laws' should guide educational reform and reconstruction? The very first thing about the coordinate frame is that the modern world is *One World.* It is a 'Global Village'. The destiny of mankind hangs together. In a scientific and technical sense mankind—in fact the entire flora and fauna—is ecologically one system. We cannot within a country and between countries have development of only one part and let the other parts lag behind. That can lead only to ruination for all. The great lesson of science today is that *Mankind is indivisible.*

To come to the second point—the fantastically rapid growth of science and technology. The doubling period is ten to fifteen years, as mentioned earlier. Science and technology are *ex*ploding, but wisdom is *im*ploding. Knowledge is expanding but the human personality is shrinking. Because of the explosion of knowledge with a simultaneous implosion of wisdom, we find various kinds of grave aberrations and imbalances which have brought mankind to the verge of ruination. There is the explosion of population. There is the explosion of violence in diverse forms. Greed, Hatred and Delusion form a rapidly rising spiral—the G-H-D spiral. Thus, on the one hand, we have the exponentially rising spiral of Science, Technology and Productivity—the S-T-P spiral; on the other we have the G-H-D spiral. And, globally speaking, the military expenditure per minute is more than a million US dollars (Rupees one crore) to fuel the Greed-Hatred-Delusion spiral. Every

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minute more than a million dollars are spent to make the world a *worse* place for us and for our children than it was a minute before. More than half the total number of scientists and engineers are working on development of weapons of mass destruction. But how tragic, tragic beyond words, is the situation when we come to think of the means of promoting *self-control* and training in self-discipline! Where is the salvation? In all probability it lies in good education and in 'good science'. By good science I mean science used to human ends. If salvation lies through education, how desparately important it is that it be 'good education'. Today's world situation is to no small extent a result of 'bad education'—education divorced from values, from character-building.

I have been speaking repeatedly of the crucial need for an interaction between science and values. What is the meaning and purpose of linking knowledge and values? It is basically character building, an endeavour to promote morality in our actions, individually, collectively, and globally. In Einstein's inspiring words (November 1950):

> The most important human endeavour is the striving for morality in our actions. Our inner balance and even our very existence depend on it. Only morality in our actions can give beauty and dignity to life.
>
> To make this a living force and bring it to clear consciousness is perhaps the foremost task of education.
>
> The foundation of morality should not be made dependent on myth nor tied to any authority lest doubt about the myth or about the legitimacy of the authority imperil the foundation of sound judgement and action.

In the *Story of My Experiments with Truth,* Gandhiji devoted four short chapters to his experiences and experiments as a teacher at his Tolstoy Farm School in South Africa. He wrote:

> I regarded character building as the proper foundation for their education and, if the foundation was firmly laid, I was sure that the children could learn all the other things themselves or with the assistance of friends... As I came into closer contact with them I saw that it was not through books that one could impart training of the spirit. Just as physical training was to be imparted through physical exercise, and intellectual through intellectual exercise, even so the training of the spirit was possible only through the exercise of the spirit. *And the exercise of the spirit entirely depended on the life and character of the teacher* [italics added]... I saw, therefore, that I must be an eternal object-lesson to the boys and girls living with me. They thus became my teachers, and I learnt I must be good and live straight, if only for their sake. I may say that the increasing discipline and restraint I imposed on myself at Tolstoy Farm was mostly due to those wards of mine.

In a world changing at a fantastic, terrific pace, it is important that there should be continuing and serious thinking by professionally committed people on educational problems and developments. A major development in Indian education arising from the Report of the Radhakrishan Commission was the setting up of the University Grants Commission. The establishment of a permanent School Commission (both at the centre and in the states) seems urgently necessary. It would mean that policy and decisions about school education, within the general framework laid down by the Government, would be largely in the hands of those who understand education, who are aware of the needs of the community, and knowledgeable about new educational developments and research in the country and elsewhere. The terms of reference of the commission and its composition of course need to be carefully examined.

In any scheme of educational reconstruction and reform an element of flexibility and diversity is most essential. The situation in practically every sphere of life, including the pattern of employment, is changing so fast today that not a few of the recommendations of education commissions are often out of date by the time their report is published. (For instance, many educationally advanced countries are now seriously considering, for various reasons, a reduction in the duration of the first degree courses from the usual *three* years to *two* years. This is relevant for us as well.)

In a situation where knowledge is doubling every ten to fifteen years, and new innovations in methods and tools of teaching are almost a daily phenomena, a teacher tends to become rapidly out of date. Besides orientation courses and summer institutes, what is important is that a teacher must avail of every opportunity—and these are plentiful—to learn from those whom he teaches. They have much to teach us because they are still young, and without preconceived ideas and prejudices. A teacher is a continuing student. He has not only to teach but also learn from the students.

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As I said earlier, we are passing through a period of unprecedented crisis in human history, a transition from one level of civilisation to an altogether new one. The Industrial Age led to the Atomic Age. Now, it appears, we are moving to a New Age. It may be best characterised as the *Age of Science and Ahimsa.* It is also called the *Solar Age,* as in the future the main source of energy to meet our diverse needs will be largely solar energy which is plentiful everywhere. To harness solar energy for our requirements we need advanced scientific and technical knowledge. In other words, the Solar Age could come only after the Atomic Age. It could not precede it. There are already signs that the dark midnight is perhaps over and that we are witnessing the dawn of a new age. The so-called crisis and chaos in education—it is almost a universal phenomenon—is in a sense a part of the transition process. What may be termed the ground law of education in the modern world is that education everywhere is in a state of chaos and crisis.

To quote from an important 1983 report:

> If an unfriendly foreign power had attempted to impose on us the mediocre educational performance that exists today, we might well have viewed it as an act of war. As it stands, we have allowed this to happen to ourselves... We have, in effect, been committing an act of unthinking unilateral educational disarmament.

The quotation is from the Report of the Commission appointed by President Reagan in 1981. And the report says that not since 1957 (the Sputnik Year) has there been such a general agreement that high school education in the USA is in a mess. "Sooner or later the administration will have to intervene", it added. Among other startling things, the Report says that more than twenty million American adults cannot read, cannot write, cannot comprehend the English language.

It is important to understand the phenomenon of educational crisis in its proper perspective. It is a part of the phenomenon of the extraordinarily rapid, fantastic change permeating the world today. We are living in a dynamic world as never before in history, radically changing in the span of the lifetime of a generation. One reason for the 'chaos' in education is the burgeoning of new opportunities and aspirations for hundreds of millions who had so long been denied all education and were living at a level of tragic deprivation. Today education is important for survival and progress, and great are the opportunities—individually and collectively—to contribute to man's advancement. And in this every step counts.

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We now come to the link between education and productivity. It is a basic characteristic of the knowledge-based society. The link, the coupling, between education and productivity is an expression of that fact that most production activity in the modern world is science- and technology-based. It will be increasingly so in the future. No nation without effectively linking education and national productivity can have the resources to provide universal primary education and universal literacy. If education does not contribute to productivity, directly and indirectly, it will inevitably be restricted to only a small, privileged fraction of the total population. Such was the case in ancient and medieval times.

The place and role of research in the entire process is apparent. We know that to improve agricultural productivity we need science and technology. This E-R-P connection is a relatively new thing: Education, Research, and Productivity. Productivity is to be understood in a wide sense. It includes improvement in the cost-effectiveness of education. The E-R-P link is a most important characteristic of our age. It is because of this interaction that universal primary education becomes possible. Education is 'dead education' unless it has a research component and it has little utility unless it is to some degree related to productivity. There is a real and urgent need for research as regards what is to be taught, how it is taught and how children learn, and the whole psychology of child development. It is an extremely interesting and important field.

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It is the teacher who gives life to a curriculum—no matter what kind of curriculum it is, good or bad. And to give life to a curriculum the teacher must have a certain measure of real liberty to engage in educational experiments and innovations—to learn something new continually from his work. We must in every possible way encourage the teacher's initiative and resourcefulness, even at the primary level, in fact more so. I have not said anything about the present dismal situation regarding availability of the basic books required by students and teachers. The prices of books are generally beyond their means. The question demands earnest consideration.

We now come to the question of *excellence* in education. Excellence is to be understood as extending over a wide range of interests and activities, that is studies, research, teaching, technical skills, promotion of social and moral values, sports, and so on. *The meaning of excellence , and how to identify it, needs to be examined continually.* This has to be done without, as far as possible, preconceived ideas and prejudices, and that is not easy. Unless great care is taken, measures for identification of talent are unlikely to serve their real purpose.

Education which does not value and promote excellence is, in the end, a waste of effort and resources. To support excellence is not to oppose the concept of equality of opportunities. Also, it should be emphasised that *excellence in an individual implies a corresponding obligation to serve the community in one's special field: the greater the excellence, the greater the obligation, especially towards the weaker sections of the community.* Where this is lacking, education would widen and not reduce the gap between the advantaged and the disadvantaged. Education must help to bridge the gap between the rich and the poor, otherwise it would be self-defeating, even harmful.

To ignore the principle of emphasis on excellence in education is to kill the very roots, the soul, of education. Divorced from excellence, education develops negative attitudes and has a negative influence on students and teachers. Emphasis on excellence is extremely important, and specially so in a period of rapid expansion of education. Expansion generally entails fall in quality. Why? Because, whereas it takes less than ten years, as past experience shows, to double student enrolments, it takes much longer to double the number of competent, devoted teachers. After World War II, in the 1950s and 60s, enrolments in higher education rose rapidly in many countries, more than doubling in a decade. That was so in our country. Now almost everywhere the expansion rate is much less. Increasing enrolment trends are, generally speaking, a global phenomenon.

A word about the "high peaks of excellence". These must compete internationally. Fundamental research is essentially global in character. The high peaks must be carefully selected in relation to our needs. We cannot obviously have the same number of peaks as industrially advanced countries with the advantage of high productivity over a long period of time. We cannot today compete with them in the numbers of peaks. But no matter how small the number, in quality the high peaks must endeavour to reach the highest international standards. That is extremely important for the morale of education, especially for the morale of the gifted youth.

The gifted, talented youth is the nation's most precious asset. But, it must be recognised, as mentioned earlier, that identification of talent, except in some very special fields such as pure mathematics, is not at all an easy thing. And often, more often than is generally realised, we can go wrong. Equally difficult is the nurturing of talent. Above all, a talented individual needs leisure and freedom. Toward identification and nurturing of talent, the University Grants Commission and the National Council of Educational Research and Training have a special responsibility.

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Today great science and great poverty and suffering exist side by side. Why so? Because the passion for knowledge has got divorced from passion for the people. The two have slipped out of phase. What we need, and in fact every country needs, is to join education, research and productivity (ERP) *with* wisdom, with the welfare of the people. In this the teacher has the key role. Therefore, a start must be made with teacher training institutions, even a few of them to begin with. *Even a small number of committed teachers can exercise a great influence.* It can be crucially important.

In the ultimate analysis, the basis of everything in education is self-discipline and self-control. Self-discipline is not imposed discipline. It comes through the example of persons of conviction and character. Such examples are highly infectious, and have a high multiplying effect. Evil is infectious but good is more so: light always triumphs over darkness, and truth triumphs over falsehood. In educational institutions there can be no place whatsoever for violence of any kind, in thought, word or deed. *Ahimsa is both the foundation and fruit of good education.* Violence can in the end only lead to more violence. And if self-discipline and social-moral values are not respected, cultivated, and enriched in the educational institutions, where else can there be place for them?

V.K. GOKAK

Human Values in Education

V.K. Gokak

V.K. GOKAK *(*b. *1909), a well known poet and novelist, represented India at several educational and literary conferences abroad. He was Vice-Chancellor, Bangalore University and the Sathya Sai Institute of Higher Learning; Director, Central Institute of English, Hyderabad; Director, Indian Institute of Advanced Study, Shimla, and Chairman, Jnanpith Award Selection Committee. He is the President of the Sahitya Akademi. His novel* Narahari, Prophet of New India *has been published in USA.*

Human Values in Education

HERE IS A THEORY OF HUMAN VALUES FREE FROM THE ATMOSPHERE OF any single religion. It is a perfectly secular theory in as much as it does not involve belief in any particular religion in order to practise it. This theory of education should find wide acceptance. It can be the basis of academic as well as moral and spiritual education. The theory gives a certain world view. This world view is not theological, nor is it scientific. It is partly humanistic and partly mystical in that it accepts the existence of an entity which figures in ancient Indian psychology—the soul.

The theory of education as it is generally practised today is summed up in five simple words. The first one is *Knowledge*. It is knowledge for its own sake that our universities aim at giving to students. Knowledge is Truth, which is intellectually apprehended. *Skill,* the second word, is one of the main concepts in education. Skill has many facets of its own. It may extend from skill in attending to personal health and hygiene to professional skill or skill in grasping fully one's own academic discipline. Righteous Conduct or Right Action refers to skill in one's own personal behaviour. It is really an ethical skill. *Peace,* is the third word, which gives us the educational principle of 'Equipoise' or 'Balance.' This is one of the choicest gifts that education has to give. It helps us to steer clear of all controversies and arrive at a synthesis or a reconciliation of opposites. It is a good sign of the culture of a person that he has this balance and that he can bring together and reconcile different points of view. Unhealthy and harmful feelings are eliminated, refined or sublimated. The educated or cultured man always maintains his balance even in the midst of stress and strain. *Understanding* or an awareness of the environment or of the society in which one lives is the fourth concept in education. It does not refer back to any one faculty in man as such. In fact, this 'understanding' is the product of the joint projection of the thought (intellect) as well as the feeling (heart) in man. Thought and feeling together are man's responses to his environment and they lead to this particular awareness of it. This is suggested by the word 'understanding'. The innate conative tendency or urge towards action also colours this joint projection. 'Social awareness' contains an incipient tendency towards action and in its absolute form as Non-violence or Universal Love, the conative side is clearly manifest both in its desistance from violence and in its insistence on an active expression of Love. The fifth term is *Gentleness* or *Courtesy*. It is related to Newman's definition of an educated man as a gentleman. A person's courtesy and affability under all circumstances and in all situations are a sign of his culture.

We may thus say that Knowledge, Skill, Equipoise, Understanding and Gentleness are the hallmarks of an educated individual. A student cultivates them during his residence in a university. When he emerges from its portals, he is taken to be knowledgeable, skilled generally and in specific spheres, and balanced and gentle in his disposition and demeanour. He has also understanding or awareness, a sense of social responsibilities. Of course, in India today, one cannot say that all these goals are realised in our universities. A certain amount of knowledge and the cultivation of certain skills can be presumed to be in the possession of an average student. It is usually a very partial or imperfect possession. As for balance and gentleness, it is true that they also are the hallmarks of true university culture. But there is no special attempt made in our universities to achieve them. It is all left to chance. The student may or may not have cultivated them.

These five values that education seeks to spread are connected with the faculties of man and his soul. The faculties are his intellect, will and heart. In producing understanding or social awareness, both intellect and heart combine together and will, too, to a certain extent, and produce it in a joint response to environment. In this sense, understanding is 'felt thought'. The intellect stands for truth, the will for skill and for doing something, and the heart for balance or equipoise. Pure love springs from the soul.

It may be desirable to dwell for a while on the meaning of these five terms, which are a part of the educational process. Knowledge or Truth, as has already been explained, is Truth intellectually apprehended. Take a statement like 'fire burns'. This is a fact of our daily experience. There is a sequence of cause and effect in it and it can be regarded as a scientific truth, like the one contained in the statement, 'Two parts of hydrogen and one part of oxygen result in the production of water.' An intellectual truth is different from a scientific truth. A statement like 'All men are mortal' cannot be fully justified merely on the basis of observation. We draw a conclusion there by way of an inference based on a series of facts. *A* is mortal. *B* is mortal. *C* is mortal, and so on. From an unending series of such statements we come to the conclusion 'All men are mortal'. We proceed to reasoning on the basis of limited observation and then come to a conclusion. What we study in our classrooms, in schools and colleges, are scientific truths and intellectual truths. They are related to a particular subject or subjects.

The second word Skill makes us aware of the fact that the education of an individual is endless. He has to learn one series of skills after another.

Self-help skills

The child has to learn how to brush his teeth and dress cleanly. The nature of body-care, for example, goes on changing with each stage of life.

Social skills

Beginning as skills concerned with a certain kind of behaviour in the classroom and on the road, these develop gradually into skills required for team-work, committee-work in school and college, some administrative work, as in the running of gymkhana departments, and consultative and deliberative work, as in the meetings of a college union. Instead of taking all this as a training period and programme, our students are in the habit of behaving as if they themselves are ministers and prime ministers. The change of approach has to be brought home effectively. Later, when they become full-fledged citizens, and participate in the running of public affairs, and hold new and responsible posts, it will be good for them if they have kept intact their receptivity for fresh acquisitions in the field of all these five kinds of skills. This will be invaluable for their work.

Classroom and subject skills

Another kind of skill has also to be continuously developed: cultivation of the memory and cultivating the skills relevant to the mastery of a subject. For example, memorisation at the first stage would mean remembering a stanza, song or prayer. At the second stage, it would mean repeating without any aid a whole poem or prose passage. Lastly, it would mean remembering an entire playlet, reproducing the different roles in it faultlessly. The skills relevant to the mastery of a subject would be many. When the child has picked up the three Rs, the various steps in comprehension follow: the grasp of general concepts and abstract nouns, once proper names and common nouns are understood; the comprehension of compound and complex sentences, idioms, figurative language, allegory and symbolism; the nuances of words; word-rhythm and sentence rhythm; prosody, free verse and cadence; different kinds of style and the individual style of an author. We have analysed here skills relating only to language. Each arts subject, each physical or social or professional science has its own set of skills and it cannot be tackled without mastering them. A physical or experimental science has its laboratory skills and a professional science like agriculture or engineering also has its outdoor skills.

Professional skills

Even when a subject like law, engineering, agriculture or medicine has been mastered, the lawyer has his apprenticeship, and so have the agriculture graduate and the engineer. The doctor has his internship. The teachers have to attend a training college and study the science and art of curriculum construction, instruction and evaluation. In fact, every graduate, wishing to put his knowledge to use in society has to learn how best to do it in his field. Certain skills are involved in this exercise. It is only the college teacher who has no regular 'internship' and educational experts have begun to feel that something should be done about him too. There is no atmosphere in our country, as there is in the West, which exercises a moral compulsion on the college teacher to be familiar with the tools of his trade.

Ethical and spiritual skills

The fifth category of skills that students have to cultivate all their life are the skills associated with a strong and sterling character. Character is the diamond-pointed will that we prepare within ourselves for practising all these high ideals about which we have dreamed. Character translates ideals into deeds. It sees to it that the means are as pure as the ends. Character strives to realise in terms of life the law of justice that is inherent in the structure of the universe.

The child may begin its spiritual career with a simple prayer and with a brief still-sitting. One then learns to introspect and hold sessions of self-analysis and self-examination. If a person wants to sound his own depths and scale his own heights, he goes in for meditation.

The third term, Balance, indicates the establishment of harmony in the *pranas* or vital self and in the emotions. This kind of control over one's own impulses and emotions is a sure sign of culture.

The term, Understanding, or Social Awareness, shows that one's education is not complete till one is spontaneously moved to care for one's neighbour or for the 'other man'. It has been said that the rent we have to pay to God for living on this beautiful earth with its lovely currents of air and waves of light is the consideration we should have for the welfare of others. This kind of awareness of one's social obligations is an important virtue whether in the ancient or in the modern world.

Gentleness, which is the last term, indicates a temperament that is full of innocence and friendliness. An educated person should never be rash or violent either in words or in deeds. He remains smiling even when he is rashly insulted. Socrates never lost his temper when his wife Xanthippe, who was scolding him for a long time for one thing or the other, finally became furious because Socrates remained cool and poured a pot of cold water over his head. Socrates did not lose his temper even then. He said "It was thundering for a long time. It has rained now." However learned and accomplished a person may be, his education is not complete till he has learnt to be balanced and gentle.

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At this point it would be desirable to explain what is meant by the words Intuition and Love. Love is the fifth and ultimate one of these five key words. Pure love flows directly from the soul and it transforms the intellect, will, feeling (heart) and understanding the moment it comes into contact with them. What is base or average metal it turns into gold. By Intuition we mean the perception of the identity that one experiences between oneself and an object, whether the object is an individual or a tree or a piece of rock. By Love we signify an experience of this identity. Both the perception and the experience belong to the world of a higher consciousness. The left hemisphere of the brain is said to be the seat of memory and of the intellect. The right hemisphere is the seat of intuition. Most of us work only with half our brain for we have never awakened our intuition and experienced its beauty or sublimity. Gentleness becomes love when it comes into deep contact with love or intuition. Intuition or love can be associated with each one of our four objectives of education—Knowledge, Skill, Balance and Understanding. The impact of intuition or love transforms each one of these values from a relative to an absolute value. All the refinement that these four objectives bring to an educated man is more or less superficial. It is skin-deep rather than soul-deep. Even a momentary contact with love transforms the relative values of education into absolute values. The absolute values which are the counterparts of the four values of education are connoted by the words: *Sathya* or Truth, *Dharma* or Right Action, *Shanti* or Peace, and *Ahimsa* or Understanding. Love itself is the spiritualised or transformed state of gentleness. Love was one of the original five components of integral education—knowledge, skill, balance, love, non-violence. But it would be clearer and nearer the truth to say that love, springing from the soul, is the common denominator, standing outside the brackets within which the four relative values of education are placed: knowledge, skill, balance and understanding. Love, in its form as the intuitive faculty, transforms these four relative values of education into absolute values. Originally, two mystical entities—the soul or *antaratman,* the indwelling one and Spirit, the individual portion of the Divine, standing above the human form and not contained in it, were used to account for love and non-violence or universal love. Only the impact of the soul is enough now to account for all the four absolute values and the rest of the framework is completely humanistic. It is love springing from the soul as an alchemical substance that transforms secular values into spiritual values. The theory of integral education includes the five values of secular education as well as the other five values of spiritual education. It is only when the relative values are pursued so as to reach their very roots in the soul that spiritual values are achieved. Education completes itself and becomes integral when this consummation is reached.

We have explained 'understanding' as meaning 'social awareness'. When this social awareness sinks in the soul and gets transformed by it, it turns into non-violence, even into universal love.

Here then we have two sets of values, one relative and the other absolute. The cultivation of relative values we ordinarily call 'education'. It comes to us in terms of factual or intellectual truth, skill or moral behaviour, calm or balance and affability or gentleness. In a good educational institution, all these values, and not merely some of them, can be acquired. But if we desire to have total or integral education, we cannot discontinue our pursuit after acquiring these relative values. The spiritual life of the individual has to be opened up. The student has to be given a taste of absolute values— changeless truth; divine law as a spontaneous impulse and action as a natural spiritual response; positive peace which is no mere balance but a cooling current of near-delight which flows into the brain and the rest of the body; and non-violence or universal love, which is the absolute or sublimated version of understanding. These are unchanging or absolute values because they grow from eternal being. It is the intuitive intellect that perceives changeless truth. It is the intuitive will that apprehends the divine law and mirrors it. It is intuition blended with balance that results in positive peace, which is the prelude to eternal delight. It is intuition blended with 'felt thought' or understanding that gives rise to non-violence or universal love. By spiritual life we mean the cultivation of these four spiritual values realised in four different parts of the personality; by the intuition blended with other faculties—intellect, will, heart and 'felt thought' or understanding. When the heart's own feeling is blended with the love that flows from the soul, we have pure Love or Intuition which touches each one of the relative values and makes them absolute.

Spiritual life usually refers to soul-awakening. Some may therefore think that to describe spiritual life as the attainment of *Sathya, Dharma, Shanti* and *Universal Love* may mean a fragmentation of the spiritual life. But this is far from true. The four words and Love, the common transforming power, give us in detail the substance of the unified spiritual life. The five words indicate that we get spiritualised in every part of our consciousness. Each faculty is turned to the soul and becomes its worthy instrument. The intuitive intellect gives us Absolute Truth, the intuitive will becomes an instrument of yogic skill or Right Action. Intuitive understanding becomes Non-Violence or Universal Love. The soul's faculty of love or intuition is a potent transforming force which leads man fully to explore his own personality, God and the universe. Spiritual life cannot be itself without the inherent unity of all these attitudes.

Integral education means the cultivation of secular as well as spiritual values. The secular values are a first necessity and, through them, students are in a graded and subtle manner led to spiritual values. These cannot be cultivated by students ordinarily all at once. They have to practise them in life day by day. What the teacher has to strive for is to see that students have realised the need to cultivate and refine their intellect, will, heart and understanding in the sphere of activity in which they find themselves. They have to be made equally alive to the need to have each one of their faculties imbued with intuition so that they are able to transform secular or relative values into spiritual or absolute values, day by day and faculty by faculty. In other words, a course of evolution has to be thrown open to them, after making them aware of both these sets of values. One cannot turn each student into a saint and every one of them into a mystic. This transformation has to be achieved by the students themselves. What Integral Education sets out to do is to strive and infuse into students an intense desire to become cultured citizens first and then active pilgrims on the path and illumined volunteers in the service of society and the world. They have first to evolve into citizens with a sense of social responsibility and into seekers with an enthusiasm for wisdom. They have then to develop into illumined volunteers in the service of humanity and active pilgrims on the path to Reality.

B.D. NAGCHAUDHURI

The Anthropological Dimension of Education

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The Anthropological Dimension of Education

WE ACCEPT WITHOUT TOO MUCH ARGUMENT THAT WE, HUMAN beings, are products of our evolution. Strangely, however, we often shy away from the consequential conclusions. For example, anthropological researches on the evolution of early man have demonstrated that not only Homo sapiens but their ancestors, Homo erectus, were food-sharing and strongly cooperative. In fact, as Richard Leakey observes:

> The mixed economy of hunting and gathering brings with it a much more efficient exploitation of the resources in the environment and also sharpens the edge of social interactions—both of which enhance adaptability of the human animal—evolutionary forces favoured its development. It (cooperation) is probably the single most important factor in the emergence of mankind.[1]

This is in entire contradiction to our approach to education in schools which is higly competitive.

Human evolution tends to underline the two remarkable characteristics, in addition to cooperation, which make us very special animals. These are our enormous capacity to learn about the world around us and try to interpret it, and our ability to structure and manipulate the environment in a variety of ways. The latter leads to, or rather is, the creation of culture and the former is, in part, the basis of education. The human child is born less well equipped to face and deal with the world it is born into than virtually any other animal offspring. Its instincts are few and not very powerful. However, an infant is born with an immense capacity to learn. This capacity is put into use to learn about the environment, the voices heard, the faces of parents, the colours and shapes seen are inputs. This capacity to learn makes us a product of our home, our school, our community. Behavioural patterns, or at least most of them, are not rigidly built into our brains. The anatomy of the brain is well ordered. It is built in such a way that it tends to maximise behavioural adaptability. Within reasonable biological limits, human beings, it is fair to conclude, can adapt to living in a large variety of environments and circumstances, practically a limitless number of conditions and surroundings. This enormous flexibility is visible in the variety and patterns of cultures in many societies throughout the world. However, during the later stages of evolution, certainly from about two million years ago or perhaps even more by another million, one pattern of social behaviour became very important. It is reasonable to presume that the forces of natural selection would have ensured that cooperation would come to be deeply embedded in the human brain.

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[1] Richard E. Leakey: *Origins,* p: 234.

The evidence in the earthy strata on the shores of lakes and river beds gives us glimpses into the past of our ancestors. It is a past not of blind cooperation but flexible response to the environment, a growing independence of the mind and skills of the fingers and a tendency for group identification and group endeavour. The social rules and customs provide the framework in which the sense of the group is expressed.The tendency to identify oneself with a group, the sense of belonging, is recognisable in sports, school ties, clubs and a myriad other manifestations in modern societies. Group identification is traceable to the innate desire for cooperation in human beings. It is the basis of an entire set of loyalties, group feelings, and cooperative effort. It has also been argued that such group identification and loyalties is the source of much of the conflict we see in the world. This argument bears examination. Conflict in settled societies is usually over our possessions, our territory. In hunting and gathering societies, territorial conflict is usually non-existent as there are no territories to defend, except perhaps under severe stress. A source of stress and consequent conflict might be a scarce resource like a water hole in a season of drought. In a hunting and gathering society such occasions would be extremely rare. With the advent of food growing, agricultural practices—farming, watering, seed collecting for the next sowing—create a vested interest in land, in its ownership. Over time land acquires importance as the sources of food, wealth and power.

The agricultural revolution, some 10,000 years ago, occuring first in Iraq around the foothills of the Tabriz mountains in Turkey spread rapidly throughout the Asian, Southern European and North African land mass. Within a couple of thousand years, agriculture had spread to most of the inhabited areas of Africa, Asia and Europe. Clearly, the possibilities for holding and expanding power became much greater after the agricultural revolution. Clearly also, a period of 10,000 years or less is too short in biological terms for the brains of our hunter-gatherer forbears to evolve to any substantial extent and, therefore, our brains could hardly be any different from theirs. This means that the momentous progress in technology, industry and science over eight to ten thousand years ago was achieved by people like us. They had the same mental equipment as we have. With this they analysed the world around them. The major social equipment of our species is cooperation and not competition. This is our strength, not to be disposed of lightly. Our only added advantage is the accumulated experience of the world and the skills that have been honed to greater sharpness over the years and finely adapted to applications and utility as never before by our ability to cooperate and pass on skills so that they accumulate.

One of man's major inventions is language, and cooperation has been aided by the ability to communicate. Communication has progressed from making noises, facial gestures and physical contact to clearly articulated, accurately reproducible sounds. Lodged in the frontal lobes of the brain, on the left side is what has come to be called Broca's area. This part of the brain is concerned with the structure of speech, its grammar—and with initiating the mechanics of the necessary muscle movements in the face, tongue, lips and larynx. One reason why apes cannot talk, in spite of intensive tuition is that they have a poor Broca's area. The Broca's area is connected by a bundle of nerve fibres to another area called the Wernicke's area, located in the temporal lobe of the brain. This is the major storehouse for visual, auditory and verbal memory.The Wernicke's area picks out appropriate words from the stored memory in the temporal lobe and Broca's area assembles them into structured speech. The Broca's area is close to one of the most important developments in the human brain, the so-called super-association area. A feature of the human brain is the way it squeezes every sliver of information out of the signals it receives, through bringing them together and comparing these in what are known as the association areas. This technique of comparing and integrating signals is raised to a peak in the super association area where messages from the eyes, ears, nose, skin, all feed into the superassociation area to be integrated into a precise thought which leads to a spoken or written sentence.

The Broca's area lies in a small, shallow indentation on the interior of the skull. Ralph Holloway, an American anthropologist, has developed a technique, making latex moulds of the interior of ancient skulls of successive ages and comparing them to study the evolution of the brain. The findings of anthropologists like Stephan and his group at the Max Planck Institute of Brain Research in Frankfurt and of Holloway of the USA, from endocasts (latex mould of the inner surface) of fossil skulls indicate that the humanness of the brain is rooted deep in evolutionary history, some three million years ago before tool making and serious hunting became a part of hominid life.

The human gift of the ability to learn, the evolutionary reshaping of the jaws and the vocal organs, led to increased articulation, but we are not certain at what stage speech came to be the strongest feature of communication. Certainly 10,000 years ago language had come of age and soon thereafter, in ancient Sumer, a written language was shaped. Even the most primitive tribes today have fully articulated language of substantial sophistication. Yet it is doubtful if our ancestors, a million years ago, had developed any substantial language for communication. The endocasts of Homo erectus skulls of a million years ago hardly show the Broca's area, indicating that speech as we know it had yet to arrive. On the other hand, the strong cooperative structure and successful hunting history indicate that the needs of communication were exerting evolutionary pressures towards the evolution of the organs of language, both in the tongue, larynx and oral structure, and in the development of the speech centres of the brain.

There must have been powerful synergies that propelled the evolution of language, cooperation and tool making during the last million years of human evolution which are now difficult to track down in the form of hard anthropological evidence because language and cooperation leave no records in the fossils. Our reliance is on indirect evidence.

However, enough has been said to indicate certain broad parameters of some consequence to the educational process. Unfortunately, there are hardly any bridges today between anthropology and the educational disciplines. So, the starting point I propose to use is the strong pressure that the education system induces in the organised cohorts of children to compete with each other for grades in some arbitrary performance scale. This pressure is contrary to the evolutionary drive in children to cooperate with each other, to build their own world of adventure and discovery latent in them. The classroom competition to outperform each other is deleterious in that it does not allow the growth of cooperation, it does not encourage the development of cooperative activity to carry out learning tasks, it inhibits innovation and inventiveness and discourages group activity by a system of hierarchical grading or marking systems which lays stress on positions in order of marks which is damaging to the ego of adolescents. What is more, it is, as I have tried to demonstrate, anthropologically unsound and contrary to nature. To cite a somewhat remote example, the enormous productivity of Japanese industry is based on group activity and cooperation, not on individual performance or production norms. The success of a group is shared by all members of the group as is its failures. The group bonds are thus strengthened and the productivity of the Japanese industry is uniquely high, surpassing that of the Americans. This is, at least in part due to the group outlook. This example is mentioned only to illustrate that cooperative group activity is not necessarily poorer or less vigorous than competitive activity with a group. On the contrary, in the educational sphere, particularly as it relates to children and adolescents, competitive classrooms are a danger to the growth of personality of the youngsters as well as cooperation amongst them.

The elimination of competition is vital for the young. While, perhaps, not so damaging, it is still a source of unhealthy attitudes amongst higher secondary and college youth. The sooner we can establish educational processes that are biologically sound, the sooner will we be able to achieve a healthier and more dynamic society.

The problems of anthropologically sound education has many facets. I have mentioned the evolution of language and learning language among these. Language as a purely human phenomenon has to be separated from the warning cries of monkeys, the mating calls of birds or group identification sounds of gibbons and wolf packs. I have indicated that language is more than 10,000 years old; certainly, it is not a million years old, perhaps much less. There are strong evolutionary pressures for the development of language as is manifest in the phenomenon ranging from the babbling of children 8-10 months old to the language articulation of a 3- to 4-year-old child. There is nothing comparable amongst any of the other primates. We therefore do not have normal guidelines or analogies to help us. Children are programmed to learn language, they are not programmed to any particular language. A child of Indian origin brought up during the crucial years in a Chinese- or German-speaking village will pick up Chinese or German as easily as Hindi. Modifying Chomsky somewhat, we can say that language capability is built into us as a genetic trait, not the capability for any particular language. The capability to learn languages is not a limited capability for one or two languages. It is a general capability which starts before a child is one year old, reaches a high between ages of two or three to eight or nine years, and decreases over the years thereafter. By about the age of 11 to 12, great deal of the potential for language has diminished.

There is here an important anthropological lesson for our managers of education to learn. Since language is most easily learnt when young, it should be taught when children are young. The argument that extra burdens are imposed on children by introducing them to more than one language is also equally untenable. In bilingual and multilingual societies children pick up two or more languages from association with other children easily and without strain at a young age. Swiss children, at the age of six, speak four languages without any perceptible effort. Grammatical ability can come with language discipline in the later years of school but the capacity to learn languages is maximal in a child between two and eight years and if we have not been able to teach languages at that age, it is going to be difficult and involve hard work for the child later on. One of the defects in our school curricula is the late introduction of languages at school with the result that the peak language learning period in a child's life is lost. This defect is compounded by wrong teaching methods at school which stultify and bore a child rather than encourage him. The cooperative elements in a child's mental make-up are strong. Children learn with greater facility in a suitable environment of group activity, such as singing and play and talking to each other, imitating each other, rather than in a strict and discouraging routine classroom atmosphere. Play, one of the built-in mental attributes of children, has not been used, in spite of its well-known advantages, by teachers and educationists for language learning purposes. Nor have we introduced languages at school early enough to take advantage of children's innate ability to pick up languages at an early age. We have often used facile but incorrect arguments about a child's difficulties at an early age, by which we have usually meant preconceived difficulties and perhaps the unwillingness of teachers, rather than serious pedagogical problems of children's capacities.

Language has other dimensions beyond communication, but not unconnected with it. Precision in use of language adds clarity to thought. It is a basis for the development of the personality of a child and a major contributor to the self-development of an adult. Language is best learnt in cooperative situations—which we can observe in children at play or work, in the way new words and phrases are passed on. New phrases and even words are created by children in such play and work situations. The contribution of language to formulation and clarification of concepts is well known. We often are unable to follow up this knowledge and use it in our educational system.

Not unrelated to the refinement in perceptions and related ethical and aesthetic concepts is the growth of sensitivity in man. Such sensitivity encompasses our aesthetic and moral perceptions, our intensity of human relationships—filial, parental, familial, and beyond to friends and neighbours. In ever-widening circles human relations extend beyond national and continental boundaries. One of the most striking examples of the development of humanity and sensitivity comes from a burial at the Shanidar cave at the foot of the Zagros mountains, currently in the region near the borders of Turkey and Iraq. The burial was about fifty thousand years ago and the archaeologists of the Musee de l'Homme in Paris who studied it were able to show that the body had been arranged deliberately in a bed of flowers and leaves before the grave was covered. The fact of a deliberate burial 50,000 years ago shows self-awareness and a concern for the human spirit. The floral decorations are a very significant indication of aesthetic sensibility, of respect and affection for the dead individual. What is even more striking is that many of the plant species used in the Shanidar burial have uses in herbal medicine or are known to have medicinal properties. The burial gives us an insight into the spirit of the people of Shanidar—their aesthetic and moral awareness. Their knowledge of flowers and plants and perhaps some acquaintance with their medicinal properties was surprisingly extensive. Taken all together, the burial gives us a feeling of humility about the sensitivity and the achievements of these people. What is even more benumbing is the thought that these people were Neanderthal men who, although our close cousins, belong to a sub-species of man which became extinct. We can only presume that we, Homo sapiens were no less developed, no less sensitive to nature and art, no less skilled, than the Neanderthal people at about the same time.

Unfortunately, our education tends to discourage sensitivity and affection, sometimes to the extent of mangling or destroying it. We often anaesthetise our children against sensitivity and beauty in the school by making it irrelevant to our school education. We are afraid of affection and love or at best we find it embarrassing. High competitiveness often destroys or inhibits the flowering of artistic and musical sensibilities, tends to discourage affection and, what is more, stultifies feelings of wonder and curiosity about nature which are the springboard of science. If education in our schools is to encourage children and adolescents to mature with skill, intelligence and compassion, we have to rethink a great deal about not only what we should teach but how we should teach our children.

An important aspect of human beings is the immense variability in the species. This extraordinary variability, it has been argued, gives us a large survival value. We survive because there are so many latent gifts, so many undiscovered endowments in man. In different and variable circumstances these potential qualities come into play. That is why we say that man is the most adaptable of animals and that is the reason for his success. Man has not only penetrated into almost every region of the globe, he has prospered and succeeded in all regions, except in the extreme cold of polar and mid-Antarctic areas. Variability is thus a treasured attribute. However, unfortunately, our education system, our schools, discourage variability and encourage a uniformity that is detrimental to our progress and the flowering of our adaptability. To take advantage of immense human variability, our schooling must be flexible. It has to make some effort to explore the potentialities of children and adolescents. To bring out these potentialities, education has to be very flexible. Strict curricula are antithetical to a genuinely flexible education. Unfortunately, however, we are an old and rigid society. Our thinking and our doing are far apart from one another. In fact our talk about flexibility often ends in stereotype solutions of conventional action. We do not observe how the language and skill of a child is transferred to other children in play and cooperative activities. Occasionally, teachers and perceptive educationists in other countries, such as Frere, have rebelled against this strait-jacket. Frere talked about deschooling society. India has had muted debates, mostly triggered by European thought. We have had a succession of commissions on education and hundreds of pages of recommendations. The recommendations have been unwilling to strike at the root of things. In implementation it has been easy to dilute these recommendations so that, in effect, we are back in our familiar strait jacket, with the satisfaction that we have added a year here or subtracted a few months there. We may have, in passing, added a little science here or a little mathematics there.

The basic issues are how education can meet the variability of man, how it can design education to aid evolution rather than retard it. How does education discover what a child is good at and encourage it? How can children develop sensitivity to others and to their environment? How can children be encouraged to cooperate and not compete? How early do we begin language education? How do we weave manual skills and linguistic skills so as to develop proper attitudes to science and technology, not merely to glorify science but to make it understandable to children and adolescents, to convey to them both the positive and negative aspects of technology and science.

We keep on forgetting simple things: it is easier to learn a language at the age of four rather than at forty; it is happier for children to work together than against each other; it is wiser that children are given opportunities or occasions to find out for themselves what they like and what they are good at than to prematurely 'guide' them into narrow grooves. As to 'what they like' and 'what they are good at', it is important to remember that the two are not synonymous and we can be misled. A child, too can mislead himself or herself, because of the visible as well as indirect power of suggestion of family, friends and school teachers. Another forgotten element or rather often disregarded aspect is the need to acquire technical or manual skills, not from a Thoreauesque moral point of view but from a basic anthropological understanding of the connections that exist between the movements of the fingers, particularly the opposable thumb and the association centres of the brain. We often work so that we can think. An artist or a painter often goes a step further, he thinks with his fingers as he draws or paints. It is said that a neurosurgeon, too, often has to think with his fingers as much as he has to think with his head; so does a painter, a sitarist, a chemist. This kind of association of head and the fingers is different from that required in monotonous manual work on the assembly line of a factory. The close association of skilled finger-work and brain work is often seen in the need of those who are intensely occupied with cerebral tasks to 'work' with their fingers. Scientists, philosophers, writers and poets often take up manual work, sometimes as 'relaxation', sometimes as a means of concentrating on a problem or issue. These behavioural patterns are of some consequence in designing education.

Let us finally look at the implications of some of these ideas for school education. We have to consider how deeply embedded is the idea of competition in our schools through the examination system. If our ideas are sound, the first attack should be on the examination system. Our effort should be to do away with it as a major source of fostering the competitive spirit and destroying cooperation between children. We can see the need to do away with examinations on theoretical grounds. In practice, it turns out to be difficult, since we begin by trying to find a substitute rather than reorient our thinking to do things entirely differently, on the basis of cooperative group activities. In Japan, work in factories has been largely reoriented on the basis of group rather than individual performance. In Sweden the classical forms of cooperative assessment have largely been replaced by performance norms in which relative individual performances are either down-played or ignored. In many universities, examinations are being replaced by various other kinds of assessment. Which of these various approaches will stay and be acceptable we do not know. The pity is that, in spite of well meaning shibboleths, the exhortations of education commissions and other educational authorities, we do not seem to be able to pull ourselves out of the groove. The UGC and our universities, all admit under powerful arguments that the examination is no longer useful. They seem however to be too paralysed to act except to find substitutes, rather than innovate new ways to do things, look deeper into human nature to find ways of doing things, not try to substitutes. One of the reasons for the paralysis seems to be lack of confidence in ourselves. We are afraid that there may be no worthwhile substitutes or that we shall make mistakes. This is tragic since our species fortunately has the resilience to make mistakes and recover, because we are biologically very generalised.

A static do-nothing situation is a very dangerous one because it leads to an accumulation of problems that can jeopardise the future of a society. Doing away with examinations is tantamount to doing without competition. In some measure, this is the helpful orientation we are looking for to emphasise the importance of group effort and encouragement to cooperation. The biological importance of cooperation is often ignored in our education. It is time we tried to bring cooperation back into our classrooms.

Cooperation and playing down competition by doing away with the examinations has advantages. The more open teaching situation where competition is played down can be engineered to encourage variability and develop a flexible education pattern to take advantage of variability of differing talents. This is to the ultimate advantage of the individual. What is more important, such a pattern of education is of great benefit to a society which needs many kinds of talents and skills for overall progress.

Language learning is another aspect where the lessons of anthropology can be applied with benefit. Children are programmed to learn the language of their environment. While this applies to children down to the age of two or three, in the school situation language learning can be introduced right from the time a child enters school rather than postpone it to periods when the anthropological pressure is diminishing. It has been argued that this imposes hardship on children. The evidence is otherwise. It is much more of a hardship at the age of adolescence and beyond than in the early period of childhood. In fact, one suspects the reason we avoid teaching languages early is the fear that it imposes hardship on the teacher and the school system. I have noted how easily children pick up languages. A girl from Delhi, four to six years of age living in Mexico began speaking Spanish in a few weeks without any tuition of any sort and soon began to interpret for her mother in their shopping and visiting forays. I have found Punjabi boys and girls of five or six in Calcutta pick up Bengali playing with Bengali-speaking children. As we have already observed, facility in learning language gradually diminishes with age and we quite unintelligently ignore anthropology and burden our youth with language learning when their abilities are on the wane. These observations accord well with what we know of the Broca's area and its development in preadolescent children. It follows that, if language learning has to be facilitated, it must be done at an early stage; in fact, as early as possible, possibly at the nursery stages at school and at play. This may mean greater effort and a somewhat different organisation of teaching, but if we sincerely want to teach languages to our young we must do it in the soundest scientific way we know.

The only skill we usually teach children is writing. Our schools tend to avoid getting into other skill areas, perhaps because they are somewhat difficult to incorporate into our rigid school system. Some cooperative skill are acquired by boys and girls through activities such as playing, scouting and camping. This is limited and a lot more is possible by supervised work on mechanics, automobiles, electronics, gardening, building and many other activities. The situations should be as free as possible within the limits of safety of the students and damage to the equipment. To the extent possible, free learning by doing should be encouraged. Other kinds of skills can be introduced by study of clays, soils, and stones, water quality; recognition of patterns of human habitats, going on to sculpture and archaeology, not by reading but by doing. There are certainly structural difficulties of school curricula and classroom constraints. There are ingenious approaches suggested by pedagogues and teachers in many countries which need to be studied for selecting appropriate approaches by school administrations. In a free situation, each school could be encouraged to find its own solution and way of doing things, rather than stereotyped prescriptions of old administrativewallahs.

One aspect of education needs special mention. Much of our education attempts to desensitise our young to their environment, to their homes, to other people. Sensitivity is a great gift and the fountainhead of a great deal of human creativity. I mentioned the unique example of sensitivity of our cousinly ancestors at Shanidar. It may be the only example that has fortuitously survived fifty thousand years of geological and climatic changes. There must have been a gradual evolution of human sensitivity because it has evolutionary advantages. It is important that our education should nurture sensitivity and not contribute to its atrophy. This is of course a tall order. We know so little about the origins of sensitivity or its cultivation. Since the contribution of sensitivity to our society and civilisation, though invisible, is so profound, it becomes a responsibility of sound pedagogy to study, nurture and find ways to improve on it.

D.P. CHATTOPADHYAYA

New Education Policy: Some Concrete Suggestions

D.P. Chattopadhyaya

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New Education Policy: Some Concrete Suggestions

THE VERY LITERAL MEANING OF THE ENGLISH WORD 'EDUCATION' seems to me incompatible, at least partially, with the proper understanding of what the underlying concept should aim at. The English word 'education' means to rear, bring up (children, animals) by providing food and attention to their physical wants. It is derived from the Latin word *educat*. Later usages of the term show that it is primarily meant for young persons so that their habits, manners, and intellectual and physical aptitudes are properly formed. In one sense the English word is comprehensive in its scope. It comprises important aspects of the personality of the young persons, viz., physical, mental and moral. But the meaning of this English word is somewhat limited in its scope in another sense. First it is concerned only with young human beings. One gets the impression that, when men are no longer young, education has nothing to do with them. Obviously this is not a very welcome or correct idea. Secondly, the word 'education' gives the impression, may be unintentionally, that the young persons to be educated are primarily *patient*, i.e., at the receiving end, and not *agent* or active in their enterprise. This is also not in conformity to the ideals of a rational system of education. The Sanskrit word *shiksha,* in contrast, means to learn by dint of efforts and followed-up by exercises. The educated person must be inspired and enterprising. Unless one wants to *learn,* it is extremely difficult to educate one in the best possible way. The learning aspect of education has been rightly highlighted in some Unesco publications in recent years. Besides, it is to be borne in mind that learning is not a one-time affair. It is a continuous effort or enterprise—a ceaseless *sadhana.* The other important point to be noted in this connection is this: the ideal form of education is not a solo enterprise. It may be launched by one, but it cannot be sustained unless others in society lend support to one. In other words, education is to be taken in the sense of learning and its proper locus is society and not the individual. Keeping the society in the dark one cannot be learned or even properly educated. The light of one's learning gets gradually dimmed if it does not get support and power from others.

The proper understanding of what education really is should not be primarily left either to politicians or government officials. Certainly, as Plato pointed out, it is a part of statecraft. In the modern context, the educationist should be concerned more with the needs of society than those of the state. Society sustains the state. The state is the power-packed superstructure of society. If the individuals living in a society are educated for serving the needs of the state, it will be bad both for the state itself and the concerned individuals. The common needs of society as well as the peculiar traits and aptitudes of the individuals must be taken care of by a rational system of education. To think of educating all alike will be obviously wrong. It stifles the growth of uniqueness of the individual personality. But the mass society of today has an inherent inclination to treat every problem in a highly generalised way. Neo-Spartanism is not an unknown phenomenon. Our contemplated system of education must avoid this possible pitfall.

Education should be so designed as to answer squarely the complex needs of the individual persons situated in a developing social context. India is neither a tribal society nor a highly developed or industrialised one. True, it has its tribal pockets. True, it has also its industrial spots and belts. A national system of education is obliged to take note of the diverse social environments and their different needs. But diversity of the individual, both within and without, deserves the perceptive attention of the policy-makers of todays for tomorrows. The developing character of our society should also be taken into account while we plan for our new educational system. Its main aim should be to make all people, especially the young ones, receptive to the ideas and techniques for social transformation and economic development. While the needs of socio-economic developments are highlighted, we must not underestimate the importance of the finer aspects, e.g. the aesthetics and ethics, of education. It is a widespread modern myth that a highly educated scientist or technologist is not expected to familiarise himself with the ethical or aesthetic digits of the time. The opposite myth is also there: the humanities and fine arts should be exclusively extolled. Given the anti-science myth, one gets the wrong impression that the man of letters and arts and their followers can well afford to be ignorant of the experimental method, its achievements and technology. The false dichotomy of two cultures should be given a decent burial.

Man is an integral unit and his education has also to be integral in its scope. Man is a psychosomatic being and he has his native spiritual dispositions. Our rational system of education must strike a balance between the different but complementary demands of the integral human nature. It is interesting to recall in this connection that Nehru, who in his personal life was an agnostic, was unfailing in his efforts to promote both science and spirituality. Like him, Indira Gandhi also emphasised the balanced importance of scientific education, technological orientation, and the quest for spiritual excellence in man. It is equally significant to note that many socialist countries which, in the past, were opposed to religion in all its forms, are now speaking openly in terms of the necessity of reviving 'spiritual civilisation' of the past. For example, the official line of thought on education in China openly recognises the importance of 'spiritual excellence'. It is a well-known fact that in the socialist countries like the USSR, all professionals—doctors, engineers and managers—are required to familiarise themselves with the accepted ideology of the country. Ideology includes elements of philosophy, politics and economics. I deliberately refer to these facts because the myth of two cultures has gained wide credibility in India. Our new education system must ensure their integration and harmony. The details of the task should be appropriate to the levels of learning and left to the concerned specialists.

The basic aim of the new education policy should be to transform our present society into a learning society. The first step towards that end is to implement the constitutionally recognised principle of universal education. Education must be made free, universal and compulsory for all children of the age group 6-14. Unless this policy is effectively and speedily implemented, the policy-makers will lose their credibility in relation to the people. The main causes of the non-implementation of this basic objective of our national policy are well-known, viz., (1) financial inadequacy; (2) non-availability of a sufficient number of suitable teachers; (3) lack of motivation; and (4) poverty.

Possible cures of the said causes have to be found. First, for universalisation of elementary education the state must provide sufficient funds. Unless this is done, other ideas, however well-intended they might be, will not fall in place and be able to deliver the goods. The central allocation for education as a whole is very inadequate in relation to our targets. This matter is so basic that if, for implementation of the programmes, an element of coercion or compulsion is to be accepted, we should not hesitate.

Related to this is the question of how to mobilise the necessary resources for meeting the needs of education. One has to be clear about the importance one attaches to education as an input for social transformation and national development. If education is accepted, as it is today, merely as a *service* sector, the fund that will be made available for it is bound to be hopelessly meagre. In the context of the needs of our developing society it must be recognised as a *productive* sector. And as such it should be given its higher dues in terms of plan allocation. Unless education receives its due productive importance in the *planned* scheme of things, it will continue to be neglected and the targets will remain elusive, despite the brave new words we are hearing and are ourselves speaking.

Secondly, it is high time that we thought of imposing an *educational cess* on the income groups who can easily afford it. Even those who cannot *easily* afford it may be persuaded to contribute a lesser amount in terms of percentage to the cause of education. Since the society as a whole is benefited by education, it has a responsibility to do something positive in this matter. Suitable laws should be enacted ensuring proper utilisation of private trust funds controlled by big business houses for their own narrow ends.

Thirdly, teachers' training programmes need to be imaginatively streamlined. This will not be possible unless closer links are forged between the school sector and the higher education sector. The NCERT and UGC must work in close collaboration. The necessity of this needs to be emphasised and adequately appreciated.

Fourthly, teachers' welfare schemes, as recommended by the National Commissions on Teachers (1983-85), should be expeditiously processed and implemented. Unless the teacher's role is made pivotal in drawing up and implementing our New Education Policy, it will go the way the previous policies have gone. The teaching profession must be made attractive, efficient, accountable and honourable. Parents' organisations, women's organisations, other voluntary organisations, and the media, must come forward and work together to motivate the people, especially the poorer sections, to send their children to school and help reduce the alarming drop-out rate. The education plan has to be effectively integrated with other anti-poverty plans and general human resources planning. It is no use saying repeatedly that the colonial system of education should be given the go-by, that we must spell out positively the terms and ends of our New National Policy. The task is not easy. But, given hard thought and determination, it is possible.

Fifthly, the Adult Education Programme (AEP) has to be taken up with due seriousness. In the task of universalising elementary education, the needs of educating the adult population of the country can hardly be neglected. Here again, the services of women's organisations and other voluntary orgnisations should be earnestly solicited.

Sixthly, since, obviously, the resources necessary for educating *all* eligible people through the available *formal* system are just not available, the importance of *non-formal* education must be duly recognised. The channels of non-formal education should be expeditiously opened up and utilised. This type of education must be qualitatively at par with the sort of education imparted through the formal channels. The two channels have to be flexibly inter-related.

Seventhly, since in spite of all our persuasion people will not be easily motivated to send their children to schools and keep them there, and the drop-out rate cannot be substantially reduced by the motivation programmes referred to earlier alone, we have to think of introducing (1) a *Food for Education Programme*, and (2) a *Garment for Girls Programme*. These programmes should be introduced in all states. The cost of implementing these programmes should not deter any government. Their potentialities in a poor country like ours are wide-ranging and very important.

Since in our mixed or welfare economy, educated people are not assured by government of employment, our education planners have an obligation to provide ways and means for those forms of education which produce people who are widely employable or marketable. The main criticism against our system of education, that it is not practice-related, must be taken with due seriousness. Consequently, components of *skill*, *vocation* and *profession* have to be judiciously introduced at different levels of our educational system. Besides general courses on language, mathematics, history and geography, some *skills* must be imparted to the students of the elementary stage (age group 6-14).

Secondly, to make *vocational* education really useful in terms of (1) job-getting, (2) self-employment, and (3) learning, we must think of introducing 4-year courses (age group 15-18). Judged by these criteria, the vocational courses offered today are likely to remain unattractive. 10+2 courses with their thin vocational content do not enthuse students, parents and employers of the private or even the public sector.

In the name of imparting good general education we must not waste precious years (15-16) of all students alike, regardless of their choice and preference. The context and needs of our developing country must also be taken into account. Similar and successful experiments undertaken in other countries like China should also be borne in mind. The oft-quoted argument against 8+4 courses, viz., "too many experiments with the course-structures (e.g. 10+2) is inadvisable " is totally unconvincing and does not disprove its fallacious assumptions and consequences. Once we have realised that 10+2 vocational courses are not going to deliver the needed goods, it is sheer dogmatism not to be willing to review and change it. The authors of the New Education Policy must have the courage and wisdom to see to it that it is really new and useful. Let us also carefully think of devising the ways of minimising the possible ill-effects of the proposed change-over from 10+2 courses to 8+4 ones.

Professional courses, e.g., Engineering, Law, Medicine and Management, should be of 4 or 5 years duration. That is, one should be a graduate by 22 or 23 (14+4+4/5). Credit of one year or so may be given to the deserving students taking 8+4 courses so that they may start their professional career rather early in life (age 21/22).

Higher education should be *selective* and related to the socio-economic needs of the country. Pressure on general collegiate and university education, including research, needs to be relieved. In this connection, we would be well-advised to bear in mind the academic practices followed in such countries as the USSR and USA. The best students cannot be given the best possible education if the composition of the class is highly uneven. Eligibility criteria for admission to colleges/universities have to be raised. The admission pattern followed in our country differs both from that in the capitalist countries like the USA and also that in the socialist countries like the USSR. In both these cases it is highly selective. In the former case it is both highly selective and very expensive. In the latter case, it is highly selective but free. Ours is cheap and unrelated to social needs and costs. *Our education economics therefore deserve a hard and close look.* The argument that students should be admitted into colleges because they cannot be given jobs is absurd. It is both misplaced and populist. The answer to the question is to be sought along the lines of vocationalisation of education and fostering the spirit of an industrial culture and self-employment.

The standard of higher education all over the country should be objectively comparable. This is necessary for ensuring the mobility of educated people from one part of the country to another. Unless it is ensured our economic benefits will be much less than what is potentially available.

Further, it will strengthen the forces of national integration.

Sub-standard colleges and universities are being sponsored and regularised for extra-academic, if not contra-academic, reasons. Although, often, the UGC expresses its displeasure over the matter and withholds its recognition for some time, it is found that eventually most of these institutions do get the financial patronage of all forms, academic, administrative and financial. A sort of populism is extensively damaging our education system. The UGC has been reduced to a mere grant-giving body. Its administrative teeth and academic interests are minimally evident in practice. For this sad state of affairs, the UGC itself is not wholly responsible. Political decision-makers have not taken enough interest in arresting this anti-academic drift in the field of higher education. The UGC's image as a purely bursary window of the Union Government needs to be substantially changed and refurbished.

Constitutional powers of concurrency between centre and states should be judiciously exercised in the larger interests of education. Besides the central universities, the old Presidency universities of Calcutta, Bombay and Madras must be helped to attain a genuine all-India character. Facts and figures show that the central universities have been reduced to mere regional universities drawing their student and teaching population from very limited areas. The said old universities are so over-burdened with their administrative work-load that they can hardly pay serious attention to academic and research programmes. The centre-state controversy need not be unnecessarily dragged into this vital area of universal concern. The absence of a body like the UGC in the field of technical education has been felt for quite some time. The All India Council of Technical Education (AICTE) is no answer to this deeply felt need. Either the AICTE should be thoroughly reorganised, to give it a primarily academic character, or it should be integrated with the UGC and the integrated organisation given a new name and substantive character.

All forms of education in general and research in particular must be closely related to national aims and aspirations as enshrined in the constitution, economic and social needs, and the needs of shaping our students of today as worthy citizens of tomorrow committed to a productive work ethos. While the policy-makers are expected to encourage pure research, special attention has to be paid to the needs of agricultural and industrial production, innovative and indigenous orientation, of modernisation and of fostering a scientific temper, and those of establishing a just and efficient social order.

The programmes and workings of different research councils/institutions like the CSIR, ICMR, INSA, ICSSR, ICHR, ICCR, ICPR, and IIAS, Shimla, need to be inter-related, minimising duplication and wastage and optimising the use of available resources, financial and human. The model of the Academy of Sciences of the USSR and of China, with suitable modifications, may be seriously considered for our own purposes. The proposed and re-organised structure of UGC and AICTE should be brought closer to the new scheme of inter-related academic bodies. Both the UGC and AICTE must have 'think-tanks' to assist them in evaluating the projects financed by them.

Except in very special cases, the products of higher seats of learning like the IITs and the AIIMS (Delhi, Chandigarh and Pondicherry) should not be allowed to go abroad for taking up permanent jobs there. Countries like ours can hardly afford a reverse transfer of resource in the form of brain-drain. Spending Rs. 1.5 lacs on each medical/engineering graduate over a period of 4/5 years, we can hardly allow the best 65 per cent of them to go abroad and meet the skilled man-power needs of rich countries. In this connection, we should learn from the experience of countries like China. The argument that, since we cannot provide them high salaries in our own country and suitable work-conditions we have no right to prevent them from going abroad, is neither strong nor fair. After all, the major part of the cost of their education is borne by the State. Besides, what is more important, the relatively weaker sections of our people living in the rural and semi-urban areas do not get the benefits of their highly technical knowledge.

To make our new educational policy successful the cooperation between the central and the state governments is absolutely essential. In this matter, both initiative and leadership should come from the centre. A Central Advisory Board of Education (CABE) should be introduced. A new all-India service, Indian Education Service (IES), should be set up in the larger interests of the education of the nation. The administration of education cannot be left entirely to the general administrators who are unfamiliar with its delicate and complex problems. Besides, introduction of an IES will strengthen the forces of national integration.

RAIS AHMED

New Education Policy: a Call for Action

Rais Ahmed

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New Education Policy: a Call for Action

IN CONNECTION WITH RECENT DISCUSSIONS ON THE NEW EDUCATION policy, it has emerged that what may have to be 'new' is not so much *policy* as a determination and a concrete blueprint for implementation. Many good ideas have been discussed in the past, admirable suggestions have been made by committees and commissions, and even a resolution of Parliament adopted in 1968 is available, but a plan of action was considered to be beyond the purview of such bodies. Perhaps, it is assumed that the secretariat of the Government would draw up suitable schemes for implementing the ideas.

Basically a question of money and management

Implementation raises a host of questions. But without going into details one can say that it is basically a question of money and of management. The requirement of resources can and should be minimised, but new programmes, or major alterations in old programmes, and even bringing the run-down facilities of our institutions up to a certain mark is going to need money. Whoever says "let's not talk of money", or that 'non-financial inputs' would serve the purpose, or that money should be diverted from one educational purpose or level to another is not being realistic, to say the least. Educationists and those who want to voice the demands of our common people clamouring for major changes in education—universalisation, removal of adult illiteracy, employment-oriented education, great improvement in the quality of education, involvement of education in national reconstruction, improved research productivity of individuals and institutions related to self-reliant economic growth—lay stress on resources, and more resources because these tasks have been half-heartedly done for decades and we are now facing the accumulated bill.

Suppose, for a moment, that we go on as before. The expenditure per student, in terms of the constant rupee, has come down a lot; it may go down further. Translated in terms of average standards achieved, and competence of our graduates for tasks of national importance, or of our ability to accomplish creative technological tasks for sustaining us in a competitive world, we would be doing great injustice to our cause and to our people. The frustration and the consequent crisis would only deepen with untold consequences for our system.

It is, of course, true that the money required could be considerably reduced if a cost-effective system of management is adopted. However, here we have the limitations of our democratic system; we are perhaps not in a position to 'order' people to donate a certain amount of their time to educational activity. Indonesia, for example, levies a year's compulsory service in rural education and uplift for all those who wish to obtain a graduate degree from its universities. There are other countries which are able to organise "brigades" for community or social service and for adult education.

From the cult of debate to the cult of action

Our foremost difficulty, however, is that we in India live in a world of words, of promises, of policy statements and resolutions. We cannot live without these and the concomitant seminars, conferences and high-powered meetings. Often, the formulation of a comprehensive policy or report takes so long that the leadership and the team change in the meantime, causing a modification of the approach—or, sometimes, even a reversal. Since the results achieved are limited, it is easy to imply that the earlier team was inadequate. Were it not for this kind of general situation, how could one account for unfulfilled targets or complete overlooking even of the National Policy on Education unanimously adopted by Parliament in 1968. Everyone knows that targets in universal primary education have been missed by a wide margin. Vocational education has really not taken off. The 10+2+3 system has not been implemented in major states. And although the Resolution unequivocally said that "The reconstruction of education on the lines indicated above will need additional outlay," and that "The aim should be gradually to increase the investment in education so as to reach a level of expenditure of 6 per cent of the national income as early as possible," this was not done when politico-financial decisions were taken over the last seventeen years.

Over the years, the Central Advisory Board of Education has passed a number of resolutions, and the two-yearly meetings of Vice-Chancellors of all universities have made recommendations, the State Education Ministers and Education Secretaries have met at frequent intervals to discuss many issues, but a concrete agreement to implement a set of programmes in a prescribed manner has perhaps never been attempted. The presumption behind all these meetings was that their purpose was 'discussion', 'exchange of ideas', or even 'evolving a policy'; not arriving at clear-cut conclusions and undertaking a firm commitment to carrying out specified programmes. This is why educational development suffers and the credibility of the agencies connected with it is lost. We have, therefore, to move in the direction of working out *implementational strategies* in the course of national and state-level meetings in which participating states/universities/central agencies enter into a grand concord to fulfil certain objectives and targets, with central or state funds committed for the identified programmes.

New approach to college development

This new approach is illustrated by a recent decision of the University Grants

Commission (UGC) to support colleges through a novel scheme. The Commission had advocated "autonomy" as a basic factor in teacher motivation and institutional development. Many programmes of examination reform, new teaching methods, curriculum changes for employment orientation, and minimum number of working days etc., had been commended and backed by funds. Nevertheless, the system has not responded merely by this mechanism of beckoning it towards attractive programmes which could be funded. So now the Commission has decided to support about 400 colleges throughout the country with a basket of money and a packet of reforms. The crucial new feature is that the state governments would be invited to strike a partnership with the UGC in this enterprise and to help in selecting the colleges to be supported in their state. If any state government or concerned university or college does not want to play the game, it can stay out. The universities and the colleges together with state governments would thus undertake a contractual obligation to implement programmes of reform in return for the UGC's contribution towards funding them. Zonal standing committees will be set up to work out details, coordinate, implement, monitor and supervise the programme so as to ensure its success. It is hoped that this strategy will work because it is based on voluntary cooperation for the achievement of precise objectives and because of its built-in system of accountability.

Let educationists administer education

Apart from a new approach, from the point of view of managing educational change two other things are of great importance. They have been recommended several times before, but now one can see that they are absolutely necessary. One is the involvement of educationists in educational administration and the other is decentralisation of educational authority.

The position with regard to educational administration at the national level has greatly changed since the Report of the Kothari Commission noted:

> The present convention is that the post of the Secretary to the Government of India is *not* [emphasis original] to be filled from the ICS or the IAS pool and that it should be given to an eminent educationist who should be designated as 'Educational Adviser to the Government of India and Secretary to the Ministry of Education'. This is a healthy tradition and should continue.[1]

Secretaries at the central as well as the state levels are administrators, usually from the IAS, and of course, being transferrable, they hold the post for short periods. These very able officers are required to face the extremely complex problems of educational change without any background and without the time needed to develop the necessary insights and sensitivities. Even below the secretarial level, an educationist is hard to find in the ministries and departments. The Report of the Kothari Commission has this to say about administrative personnel:

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[1] *Education and National Development: Report of the Education Commission*, NCERT, 1966, para 18.32, p. 830.

> First, in education, administration is a service agency to teaching and research and not their master. Secondly, one cannot be a good educational administrator unless one is also a good teacher. Thirdly, there should always be a possibility for an educational administrator to come back to teaching and research and for a teacher to go over to the administrative side on a tenure assignment.[2]

If educational administration at the state and the central level is to deliver the goods, and play a positive role in ushering in educational changes of a far-reaching character, such as bridging the gulf between educational programmes, institutions and management systems on the one hand and productive activities and enterprises and their management on the other, or play a part in giving a national character to education, we shall have to have the administration run mostly by educators. These educators may have to be specially selected, mostly from working teachers or researchers, and they may have to be exposed to a short period of training. Thus a national pool of educationists for appointment to middle and high administrative positions will have to be created, and at the very top of the pool, members would have to be transferrable from one state or region of the country to the other.

District Education Committees

The creation of a Council of Education in each state concerned with all education below university level, and of District School Boards had been recommended by the Kothari Commission on the basis of very sound reasoning. In particular, coordination of educational programmes spread over a number of departments and directorates—such as agricultural and medical education in the Departments of Agriculture or Medicine, industrial training under the Department of Industries, adult education sometimes under Community Development Administration, education of tribals under different departments—was mentioned so that an integrated view could be taken and there might be better articulation and economy of effort in the carrying out of these programmes. The involvement both of academics, in an advisory capacity, and of the community at large, as a 'consumer', is equally important.

More recently the discussions on vocational education and employment, and also those on 'socially useful productive work' or work experience at the school level—involving, in part, participation of students in work-activity going on under development schemes or normal production in farms and factories—and the tertiary level extension-cum-academic programmes, have also led to the idea of District Education Committees which would devise and help in implementing activities cutting across a variety of agencies. The idea of these committees raising local funds, or mobilising non-financial inputs such as cooperative use of facilities, or sharing of responsibility to procure midday meals or books or uniforms (particularly for girls) has been raised. It appears, therefore, that a suitable composition and charter of responsibilities for such District Education Committees would go a long way in executing and monitoring new educational programmes. In fact, extension activities and vocational programmes would probably not achieve significant success in the absence of such a forum and instrumentality.

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[2] Ibid., para 18.45, p. 837.

State Education Councils

To the State Education Councils recommended by the Education Commission and meant for non-university education, a State Council for Higher Education may be added as a statutory body to project and plan the expansion of collegiate education with due regard to relevance, to coordinate the work of the universities, especially in research, and to look into and determine the financial needs of the universities. The Council would cooperate with the UGC in maintenance of standards and for this purpose it would set up a statistical and a monitoring cell. The Council may include a few secretaries to the State Government dealing with the various branches of professional and general education and some representatives of public or private industry and agriculture, but the majority of its members should be vice-chancellors and other academics. A good deal of autonomy must be ensured for the Council so that it might play a leading role in ensuring the success of the many schemes and programmes of reform of higher education.

It has been strongly recommended to the Government that all ministries and departments having large programmes of growth, and hence allocations of money, must earmark 5 per cent of these funds for manpower development. Resources raised in this manner should be made available to the two State Councils so that they are used imaginatively for the broad purpose of human resource development.

This change in the structure of educational management is as essential as more funds, because it would generate enthusiasm, provide new ideas, help in creating acceptability for new approaches to educational reform, and will lead to prompt decisions on complex issues which today confound the administrator.

Let us hope that the vitality of a courageous approach which the present Government has displayed will reanimate the educational scene before long. Action is what everyone has been waiting for.

P.L. MALHOTRA

School Education: Some Issues for Consideration

P.L. Malhotra

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School Education: Some Issues for Consideration

THE FAST-MOVING CHANGES IN THE SOCIO-ECONOMIC, CULTURAL AND political spheres in India have brought to focus the need to identify policies and actions that would be in tune with the emerging trends and would be relevant to our long-range educational concerns. Education being dynamic in character and an on-going process, policy formulations need to be based on continual evaluation and critical analyses, keeping in view what the country is aiming to achieve; what parents, teachers and learners want; and the educability of the target groups. In order to identify the most viable policies and practices, it is necessary to undertake a systematic study of updated information related to the following:

- — Changing national policy directions associated with all sectors of development.
- — Statistical data related to different aspects of educational development, population growth and its impact on educational systems, growth, employment and productivity.
- — Financial and human resources available for educational programmes over a reasonable period of time.
- — Feedback on the impact of the policies and practices already implemented and strategies for wider adoption of the concepts evolved and techniques developed under the on-going successful programmes.

One of the reasons for the failure of some of our educational reforms in the past has been the lack of a broadbased process of ascertaining and influencing public opinion at different levels. A conscious attempt must be made to share with workers in the field of education, with parents, and with learners, views on the emerging problems and their magnitude and impact, and to involve these groups in the process of educational reform and renewal. School education, therefore, must become a people's movement.

While national issues related to education need to be given importance, there should be no neglect of sectoral issues, such as those related to backward areas, remote and far-flung areas, slums etc., which often do not get the needed support due to a lopsided emphasis on non-priority areas because of pressure from the influential sections of the society.

The approach to the Seventh Five Year Plan emphasised growth, equity and social justice, self-reliance, and improved efficiency and productivity. It stressed the need for harnessing human resources and improving their capabilities for development equitably.

In keeping with this approach, the aim of education must be to provide opportunities to all persons, regardless of their age, social class and economic status, to acquire the knowledge, skills, attitudes and interests conducive to the development to the different aspects of their personality, and to improve their communication, productive and vocational skills in a manner which is relevant to their cultural heritage, the socio-economic needs of the present, and the societal and national aspirations for the future.

Some of the issues which have implications for policy formulation are:

- The limited resources available for educational development relative to the growing demands on the educational system.
- The constraints due to which children from the weaker sections of the society are compelled to remain outside the formal system of education, impeding possibilities of improving their productivity and welfare.
- The low efficiency of the formal system due to ineffective and under utilisation of resources; the low productivity due to stagnation or dropout; and the low quality of the products in terms of attainment of the expected behavioural outcomes.
- The criticism of the existing system of education on the grounds that its content and processes are dysfunctional to the requirements of the country and are irrelevant to the needs, life styles and economic prospects of a large section of those who receive it.

Therefore, the major thrust areas that need to be considered are:

- Mobilising of resources and resource allocation in proportion to the priority attached to the different sections of educational development.
- Guaranteeing to all, equality of educational opportunity, for improving the quality of life of the people and enhancing their participation in the task of promoting national development.
- Improving the quality, relevance and standards of education at all stages through renewal of curricula, to make them relevant to the needs of learners; provision of appropriate infrastructural facilities; adoption of innovative teacher-training methodologies; use of new technology for qualitative improvement; and adoption of new, effective and decentralised management alternatives.
- Establishing dynamic and beneficial links between education, employ-

ment and development, in consonace with the economic and social goals of the community and the country.

- Promoting the values of national integration, secularism, democracy, socialism and dignity of labour.

Resource needs

The gap between the demand for education at all levels from an increasing number of people and the resources available to educate them continues to persist. The financing of education has become almost totally the responsibility of the government, and the contribution from the non-governmental sectors has been decreasing steadily. In order to overcome the financial constraints, especially in the priority areas, the new educational policy should consider the following:

- Raising the allocation for education by shifting financial resources from other developmental activities so as to increase the allocation for education to at least 6 per cent of the GNP.
- Redistribution of existing resources among the different priority areas. The rate of return on investment in primary education has been found to be significantly higher than that on secondary and higher education. Therefore, more resource allocation should be made for the elementary education sector.
- Reducing the unit cost of education by eliminating inefficiencies and by altering technologies.
- Reducing costs on teachers by using the services of apprentice teachers to assist full-time teachers for a specified period of time.
- Increasing community-financed or supported educational institutions by encouraging establishment of schools by the private sector.
- Sharing of the cost of education by sectors which utilise the products of the education system, and levying a cess on selected items.
- Raising the cost-effectiveness of current educational programmes through consolidation of learning facilities and through use of non-conventional teaching personnel.

Equity in education

Inequities in the distribution of educational opportunities have accentuated disparities. The poor have not been able to take advantage of formal education. Therefore, a deliberate attempt should be made to reach the poor within each of the groups assigned priority, and to improve the quality of the education imparted in rural schools. The policy in respect of equity should highlight the following:

- Universalisation of elementary education and eradication of adult illiteracy in the shortest possible time. Universalisation of education should encompass universal provision of educational facilities, universal enrolment, universal retention and quality improvement, enabling children to successfully complete the elementary stage of education. As a strategy, it would be desirable if concerted efforts are made to achieve universalisation of education in a phased manner, beginning from class I. Efforts should be made to attain universalisation of primary education (classes I to V); subsequently, efforts should be directed at universalisation of education at the middle stage (classes VI to VIII). Even within the primary stage, the attempt to universalise education should be made in two stages. Those states which are yet to universalise primary education should attempt to achieve it in the first three classes (classes I to III), and subsequently in classes IV and V.

— Implementation of programmes of reforms which would benefit girls and children from the weaker sections of the society, including Scheduled Castes and Tribes.

— Providing quality education to the deprived by making available balanced resources and adequate infrastructural facilities in institutions located in rural, tribal and far-flung remote areas.

— Providing educational opportunities through the non-formal and open systems of learning to children who cannot take advantage of the formal system of education. However, care should be taken to ensure that the non-formal systems of learning do not become sub-standard substitutes for the formal system of education. The non-formal systems of learning should enable a child to move into the formal system if he so desires, and equivalences in terms of attainment of certain core competencies must be clearly established so as to enable horizontal and vertical mobility.

— Development of early childhood education programmes as a supportive programme to bring the weaker sections of the society into the fold of elementary education. Efforts should be made to attach an early childhood education centre to every primary school in a phased manner.

— Opening secondary schools, especially in rural areas, as well as developing alternate channels like open schools and correspondence and part-time courses to meet the growing demand for secondary and senior secondary education by those who successfully complete elementary education.

— Adoption of the neighbourhood school concept to enable children in a locality to get enrolled in the neighbourhood school irrespective of social class or economic status.

— Adoption of the three-language formula at the school stage and adoption of either the mother tongue or the regional language as the medium of instruction at the school stage. At the primary stage, only one language should be studied compulsorily—the mother tongue or the regional language—whichever the learner opts for. At the middle stage, the course in language may include the study of a modern Indian language and English in Hindi-speaking states and Union Territories, and of Hindi and English in the non-Hindi-speaking states.

Qualitative improvement

Measures to improve the quality of education at all levels should be given top priority. This would call for the following:

— Provision of adequate and appropriate physical and other infrastructural facilities in all schools, especially in rural areas.

— A moratorium on establishment of ill-equipped and substandard schools.

— Renewal and enrichment of curricula and instructional materials to make them relevant to the needs of the target groups.

— Providing freedom to teachers to link their teaching, within the specified curriculum framework, to any aspect of the social, cultural and physical environment of the school.

— Organising networks of educational institutions to form school complexes in which the big and better equipped schools will join in partnership with the small and ill-equipped schools in attending to the schooling needs of *all* the children in a given geographical area. Each school complex should include a secondary/senior secondary school as its centre. The same set-up should be repeated at a higher level between colleges and university departments, on the one hand, and the secondary/senior secondary schools in their neighbourhood on the other.

— Greater community participation in the management of schools. Necessary plans should be evolved whereby schools should be encouraged to move in the direction of managing their own affairs to an increasing extent, as they show their willingness and capacity to shoulder such responsibility.

— The establishment of a number of resource centres in which a variety of materials would be available for use by children—those enrolled in formal schools as well as in non-formal learning centres.

— Increased use of the mass media for performing supportive and enriching roles, both for qualitative improvement and for teacher training.

— In-service training of teachers to enhance their competence and to update their knowledge of the content as well as of pedagogical developments related to instructional methods. The in-service training will have to be made competence based and relevant to local needs and conditions. This would call for distance-learning systems, the use of multi-media packages as well as self-learning packages, and the establishment of district and block-level resource centres.

— The gradual withdrawal of the public examination at the secondary and senior secondary stages and the delinking of certificates from jobs should be pursued in a phased manner. This would imply decentralisation of testing, at the district level to begin with, and at the block and institutional levels later on. Along with this, it would be necessary to introduce a selection examination for entry into higher education or for securing a job. Such decentralisation may cause difficulties in the beginning but will be beneficial in the long run.

— A combination of testing at the national level and local level needs to be organised. Certain core subjects should be examined at the national level while some of the academic disciplines could be examined at the local or district level. It is feasible for schools to set their own test papers and have them moderated, before administration, by panels of specialist teachers to make them comparable to regional standards.It is necessary to introduce continuous assessment of the progress of learners throughout the academic year in all classes. The disparity and imbalance between the states in terms of standards of education, of student attainment, has been creating problems of equivalence at the time of admission to higher educational institutions. A major need, therefore is the designing of a national system for testing student attainment. For this, a National Testing Service needs to be developed and admission to the higher institutions of education should be made on the basis of the testing done by the National Testing Service.

— Modern technology offers enormous potentialities for the qualitative improvement of education, the removal of mass illiteracy, for providing educational opportunities to those hitherto unreached, for reducing imbalances among regions and social groups and for the training of teachers. Advances in educational technology should be exploited to support and enrich learning in educational institutions.

Education and work

The linkages of the education system with the world of work need to be pursued vigorously, especially at the middle, secondary and senior secondary stages of education. The education policy should focus attention on the following:

— Education centred on productive work should be given importance in the process of education. The work activities will have to be so selected as to conform to the physical abilities and needs of the growing child in relation to his place in society as a productive citizen. Work should be an integral part of education at the middle, secondary and higher secondary stages, and each student must be required to spend adequate time on productive work.

— Vocationalisation of education at the higher secondary stage should be specially promoted so that education increasingly provides the skilled personnel needed by the economy and facilitates growth and productivity. This calls for developing curricula and instructional materials related to different vocations. Considering the significance of linking education to national development and employment the Central Government would have to play a more positive and dominant role for implementation of the programmes for vocationalisation of education at the+2 stage.

— The various systems related to vocational education operate in isolation and under a near-total lack of coordination between different agencies at the Central and state levels. It is necessary to bring all the agencies working in the area of vocational education under a unified national authority. It is also necessary to develop linkages with the organised sector in identifying manpower needs, types of skills, resource and placement facilities for practical training, sharing of cost, etc. In addition to this, training through the formal and non-formal channels in the rural traditional occupational skills, in order to increase the absorption capabilities of the unorganised sector, should be explored. The National Apprenticeship Act should be amended to allow the apprenticeship facility to students completing vocational courses at the +2 stage.

Moral education and national integration

The growing concern over the erosion of values in public life has brought to focus the need to critically examine the various aspects of value education at the school stage. A new orientation has to be given to Indian education to bring it in tune with the emerging needs and aspirations of the country. The curriculum, instructional materials and teaching methods should be directed to inculcate values of humanism, rationalism, socialism, national integration, civics and democracy, as well as ethical and moral values in general.

The need for promoting social cohesion and national integration requires emphasis, particularly when fissiparous tendencies are emerging in our national life. Education, being an important instrument to bring about social change, has to assume the major responsibility in ensuring acquisition of the values of national integration and secularism. Apart from evaluating textbooks in all subjects with a view to removing materials which are prejudicial to national integration, it is necessary to develop and incorporate in the system textual materials which promote national integration.

The history of the freedom struggle and the sacrifices that the people have made for achieving independence must become an important part of the curriculum at all stages of school education. It is necessary to develop a core content with the purpose of acquainting children in different parts of the country with the struggle and the sacrifices that the country made for achieving independence.

Educational planning and administration

The new thrusts and changes recommended make it imperative that appropriate steps be taken for improving administrative capabilities at all levels for the formulation, planning, implementation, monitoring and evaluation of programmes. The existing structure of planning, monitoring and evaluation would have to be strengthened considerably, particularly for building up capabilities at district and state levels. Procedures for timely monitoring and evaluation of the projects/programmes would need to be instituted at every level of educational administration so that corrective action could be initiated, as and when required without delay.

Programmes for the training of educational administrators should be strengthened with a view to strengthening the administration and building-up management capabilities at the State level.

The quantitative expansion of educational facilities and the appointment of teachers have far outstripped the existing supervisory machinery which falls below the level required to link effectively the educational planners and administrators on the one side and the institutions on the other. The enormous expansion in education has increased the responsibilities of the inspector manifold and he is no longer in a position to discharge his responsibilities effectively and efficiently. Another aspect that needs serious consideration is the effective functioning of the subject inspectors of schools, particularly at the secondary stage.

The most fundamental issue which needs to be constantly kept in mind is the stark statistic reality. Whereas we have more than 290 million literate people in our country (more than the entire population of the U.S.A.), there are over 400 million who are illiterate. We have 110 million children in the school system, about 5 million school teachers, 500 thousand schools. Yet 40 per cent of our primary schools are single-teacher schools. The rate of drop-out is above 60 per cent and there are over 2 lakh schools without buildings or any other basic facilities.

Over the next few years we have to take 60 million more children through the formal stream, and about 100 million through the non-formal stream, if we are to achieve universalisation of primary and elementary education.

Obviously the issue is not only the creating of more resource centres and the use of the existing established schools to act as resource centres as part of their social commitment, but the generating of a movement in the country for greater participation and involvement of the community in raising resources. Perhaps a National Foundation for Promotion of Literacy should be established and more imaginative and bold steps taken to raise financial resources. Can we not raise resources for education by imposing a two per cent tax on the cost of petrol, a one per cent tax on each railway ticket, a two per cent tax on the agricultural income of those holding above five acres, a five per cent tax on urban elites who have land-holdings or farm lands, a two per cent tax on the income from the tea and coffee plantations? Can we not raise a five per cent educational cess (rising area-wise) from urban property built on land exceeding 200 sq. yards? Can we not tax from two to five per cent the remittances coming from abroad? These are just some stray thoughts. But what is required is more *affirmative action* to meet the challenge of equity and excellence.

One of the important issues that I have talked about concerns equity in education. I strongly feel that if any affirmative action is required, it is that immediate steps should be taken to minimise the hiatus that is fast widening between the privileged sections of our society and the underprivileged—the more so in our school system. There is need for a new ethos in policy, in planning and in the administrative set-up—one that would not only control the educational system but would also reduce disparities.

Much will depend on what each of us concerned with education does, individually, along with others sharing this concern, and with the community at large, in a spirit of 'togetherness', as Prime Minister Rajiv Gandhi once described it. When material resources are scarce, the human resource must bridge the gap.

K. VENKATASUBRAMANIAN

Education Should be Something Different

K. Venkatasubramanian

K. VENKATASUBRAMANIAN (b. *1929) did his doctorate in economics from M.S. University, Baroda. He was the Director of Education, and Member, State Planning Commission, Tamil Nadu. He introduced innovative programmes like the Free Midday Meal Scheme, the School Improvement Scheme and the Vocational Education Scheme at the +2 stage. He is now the Vice-Chancellor of Pondicherry Central University. He was member of various national and international educational bodies.*

Education Should be Something Different

THE HON'BLE SHRI K.C. PANT, FORMER UNION MINISTER OF EDUCATION, inaugurating a seminar on 'The New National Policy on Education' at Madras in June 1985, observed:

> The comprehensive review of the existing National Policy on Education is being done with a view to making education the more effective instrument of social transformation and national development. Education can no longer be a matter of concern only for the pupil or the parent. As the main instrument of change, education should be considered a key input for national development. There is indeed no field of activity or sectoral development which does not have its impact on the educational system. The challenge of the 21st century imposes a responsibility on us for restructuring our educational system to suit the changing needs of the future. Education is a charter for the development of human resources. Education therefore should be regarded as a productive investment in the country's development as well as an investment in the future.

This, in a nutshell, clearly portrays our aspirations for the education of tomorrow.

Shri Kireet Joshi, Special Secretary, Ministry of Education, Government of India, in his keynote address at the Madras seminar said:

> The human personality consists in the harmonisation of the capacities of the physical, the vital and the mental being under the guiding force of three values, namely truth, beauty and goodness, which are inherent in our deepest centre of integration. A fully developed personality manifests a progressive synthesis of wisdom, power, harmony, and excellence in skill and works. The teaching-learning process should be so organised that capacities and powers of personality are constantly irrigated and nourished by the inspiring flow of values of personality.

The time is ripe for undertaking a general reappraisal of educational development in India and to consider the challenges that we have to face in the field of education today and tomorrow in the wake of developments taking place in all spheres and also in the wake of the demands of the society, economy and individuals. Piecemeal reforms now and then that have taken place so far will not suffice to build an adequate educational system and a reorientation and reassessment of the objectives are necessary to bring about an overall transformation that will make education both sufficient and efficient to meet the needs of the present and the future. We must also take a new look at priorities in the education sector which should be determined in a more realistic and innovative way than hitherto. The time has come to take a big step forward, not merely on the operational plane but at the level of ideas and ideals as well.

Education without frontiers

The appropriate system of education for the country would be one geared to its most urgent human and economic needs, not to alien and abstract notions of what education ought to be. The main directions of educational reform can be determined by an understanding of the shortcomings of present-day education and anchoring our prospective outlook in the factors behind them. This will only enable our country to transcend the barriers of all kinds which hamper our aspirations and paralyse our confidence.

If educational reforms are to be adequate and effective, they should not be limited to only a few sectors but should take account of the underlying links between education and the social system as a whole and also certain vital forces which can influence change.

A vision "beyond space and time", the elimination of barriers which isolate the school from society at large and divorce work from training, a sustained effort to close the gap between generations, the stimulation of cultural life wherever it can develop and thrive—these are some of the practical requirements for a fruitful educational reform. For this, a long-term plan is essential which expresses a bold vision of what the education of the future should be if it is to produce individuals who will rebuild our society.

An overall diagnosis of the current ills of the educational system is therefore necessary. Based on this, a radical change in the objectives must be undertaken; a new list of priorities must be drawn up; and 'points of entry' designed, all of which will affect systems, content and methods. It is also necessary to identify the choices to be made so that the spirit of creativity, on all sides, so vital in a phase of innovation, is encouraged.

Building the future

The aim of the reorientation of educational policy should not be to predict the future but to build it. The new edifice has to be constructed with the help of important cornerstones. Education must encompass four important aspects, namely, (1) it must be life-oriented, not only in preparation for careers but also in accordance with the continuous change in society and technology (this also includes counselling so that there can be some means of adjusting people's reactions to the challenges which they face); (2) participation by the society consisting of teachers, parents and students; (3) development of personality and attitudes for making a person a fuller and complete person, the author of his own fulfilment, a balanced personality; and (4) education as an agent of development must be a continuous process for society as a whole.

Life-oriented education

Lifelong education thus becomes the master concept for educational policies in the years to come. Education from now on can no longer be defined in relation to a fixed content which has to be assimilated but must be conceived of as a process in the human being, who thereby learns to express himself, to communicate and to question the world through his various experiences and, increasingly, all the time to fulfil himself.

Life-oriented education is a renewal of the idea of education itself, in the sense that it is not a new structure to be attached to an already existing structure; it involves a complete reorganisation of education as a whole. Recurrent education appears as a structural framework within which lifelong learning can become a reality. It is a principle, an orientation, almost an ideology, rather than an activity or a form of organisation.

Changes in the system of education should be brought about to cope with the snowballing accumulation of scientific expertise and the explosion of knowledge in every field that trigger vast, quick and far-reaching changes in our way of life. This is the age of technological explosion and a stimulating awareness has to be created among the students about the dangers of the situation and also about the benefits of the technological innovations. In this context, education has to prepare people for changes, show them how to accept them and benefit from them and create a dynamic frame of mind.

Educational institutions to be energy centres

Educational institutions should in future be devised to function not only as centres of acquisition of knowledge but also as creators of vital groups of children, young people and adults, to mobilise their social, natural and productive energies. There should be coordination between the different types of teaching, namely general, scientific, technical and professional. One of the basic objectives of science teaching should be to underline the interdependence of knowledge and action. This concern should lead to the dovetailing of science teaching and the teaching of technology, to highlighting of the relationship between research, practical development and application.

Lifelong learning depends also on efficient counselling which will break the old habits of school, overcome the idea of education as a mere introduction to adulthood and guide individuals to enrich their whole lives. Counselling is not only a means of implementing the other basic principles which will underline tomorrow's education but it is also a basic principle in itself. It is not a marginal aspect of education but central to it, having two distinct aspects, namely orientation and guidance. It should be an integral part of a teacher's work to make the educational process a full-fledged one.

Participation by the society

The very nature of the relationship between society and education is changing. When society finds itself on the threshold of great changes, education ceases to be a mere reproduction of the past but rather it becomes creative in the sense of preparing people positively for the creation of a new society.

Instead of having a system of examinations, we should have a system of education. The right system of education should be one which is relevant to the society's particular needs and purposes. In such a context, the function of the schools should be different from the existing one. This requires a restructuring of the primary system, improvements in the quality of instruction, radical changes in teaching methods and in teachers' attitudes, innovations in the curricula, etc. Also, the pattern of vocational education should be such that the cultivation of initiative and self-help are the dominating objectives.

Students—catalytic agents of change

The students have to become the transformers of the world. They should be the catalytic agents of change. We have so far approached the question of education from the teaching end. Learning should be the end; teaching is a means, one of many. Learning and teaching structures should not be strictly compartmentalised disciplines; instead there should be an interdisciplinary approach, combined with problem-centred learning. In other words, education should provide us with a new form of 'wisdom'. What is required is not knowledge alone, but resourcefulness also, and to develop this, learning should be in terms of 'whole person' learning. This can be developed by inventing new and more fruitful relationships between the teacher and the taught. The mutual roles played by the teacher, the learner and the parents are only to help the students to widen the vistas of knowledge.

Man making—true end of education

The substance of education should lead to the creation of a fuller man in the sense of having a person capable of positive interaction with the environment. The latent resources and potential energies dwelling deep within the people should be evoked through operational, scientific and rational organisation. "Man making" as Swami Vivekananda would call it, should be the aim of education.

Each child should have the opportunity, under competent guidance, to develop fully and richly as an individual and as a cooperating member of an inter-dependent society, full of manifold social, religious, economic, community and governmental agencies.

Spirit of enquiry

Education must encourage the development in each citizen of three things: an enquiring mind; an ability to learn from others; and a basic confidence in his own position as a free and equal member of society. The whole system of education should be permeated by a spirit of enquiry. The aims of education should lay stress not merely upon the ideals from which a curriculum can be derived but also take into account the activities which individuals carry on. The activities underlying the broad range of human experience are social intercommunication, maintenance of physical efficiency, efficient citizenship, general social contacts and relationships, general mental efficiency, leisure occupations, religious activities and attitudes, parental responsibilities, occupational activities, etc. Also cultural values, societal needs and learners' experiences directed towards knowledge, understanding and skills should serve as a guide to curriculum development. Hence primary education should be conceived as a system of preparing children to become fuller citizens of the society.

Agent of democracy and development

The needs of the society and the needs of the individual are interactive. Education should not only interpret democracy as a total way of life for the rising generation but should also advance the norms of democratic living to a higher level of maturity with each new generation.

The changes brought about in all aspects of daily living by the scientific and technological revolution and the pressures for preserving and nurturing democratic values in a world of tensions have resulted in demands being made on the school to accept new responsibilities for the development of children and youth—intellectual, social, physical, aesthetic, and moral.

The way to achieve equalisation of educational opportunities is to attempt to widen the horizon and extend the base of the curriculum. Instead of a 'subject-centred' curriculum we must have a 'child-centred' one. The equalisation of educational facilities for all children will not bring about equalisation of educational opportunities until all curriculum work is centred on the child and not on the subject. Hence, while the school need not accept the sole responsibility for total development, it should see that the total development of children and youth is provided for.

Human values

In the matter of higher education, the traditional functions of a university consist of acquiring, preserving, disseminating and extending knowledge. Other functions include promotion of human values, promoting competence in problem-solving and decision-making, blending our cultural excellences with those of other cultures, facilitating national unity and growth through a rational outlook, developing a total personality among its members; and promoting communication abilities. Higher education must also heighten involvement in group action and social action and commitment to the pursuit of excellence; it must produce service-minded and action-oriented persons capable of achieving national goals, including social justice.

There have been a few innovations in the field of higher education, like open universities, which have developed a new technology in education, namely learner-oriented programmes involving continuous evaluation.

Many more such innovative programmes should be launched which should be self-evaluative.

Academic motivation

A strong academic motivation has to be introduced at all levels by appropriate policies. Such a process of academic regeneration can be brought about only by mobilising, to the full, the latent abilities and enlightened self interest of teachers on the widest possible scale. Organisational and administrative arrangements should be revised in such a way that greater flexibility is encouraged and greater participation and display of initiative in academic matters are encouraged.

It is clear that the standards of higher education and their relevance to the contemporary social and economic situation in the country can be improved only through a variety of measures. It is therefore on these measures that the attention and energies of the academic community, particularly of teachers and students, need to be focussed. The purpose of the reform in the organisational and administrative arrangements is essentially to create an environment and a climate in which this can be done.

The basic objectives of education are knowledge, understanding and application and the inculcation of a capacity for analysis, synthesis and evaluation. These have to be cultivated in the learner through appropriate teaching-learning methods.

Within the educational system, the frontiers of knowledge are continually expanding and research becomes an important function of higher education. Cultural change rather than stability becomes the norm and the educational emphasis shifts towards innovation and dissemination of new knowledge. The preservation of culture is not eliminated, but old ways of adaptation are subjected to the rationalising force of a science-dominated culture. It is increasingly realised that the frontiers of education ought to extend well beyond the confines of the school and college.

The concept of education limited in time (to the school years) and confined in space (to the school building) must be superseded. School education must be regarded not as the end but as the fundamental component of educational activity, which includes both institutionalised and out-of-school education.

Prepare for 2001 from now on

The cardinal principle of the education policy that will govern education in the coming years will be:

1. national integration;
2. introduction of modern scientific ideas like computer education;
3. education based on experience; and
4. in the sphere of higher education universities will be motivated to do research which will have a social impact.

Our Prime Minister, Shri Rajiv Gandhi, has thus described our objective:

> Our youth should have the vision of the 21st century, since this generation has the privilege of seeing the birth of the 21st century. It is, therefore, imperative that we plan our education for the new century.

Let us plan for a new century from now on.

K.L. SHRIMALI

Planning for Equality of Educational Opportunity

K.L. Shrimali

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Planning for Equality of Educational Opportunity

ARTICLE 45 OF THE INDIAN CONSTITUTION LAYS DOWN THAT THE STATE shall endeavour to provide, within ten years of the commencement of the Constitution, free and compulsory education for all children until they attain the age of fourteen years. Although the target still remains unattained, the State has made considerable progress towards the realisation of this goal. This is clear from the increase in the enrolment at the elementary stage. In 1950-51, the total enrolment of children in the age-group 6-11 in classes I to V was 42.6 per cent and in the age-group 11-14 in classes V to VIII only 12.7 per cent.[1] In 1978, in the corresponding age-group 6-11 in classes I to V, the gross enrolment ratio went up to 82.31 per cent, and in the age-group 11-14, to 36.92 per cent.[2] Considering the fact that a considerable part of the meagre financial resources of the country had to be diverted for defence purposes, this is no mean achievement. When the Constitution was drafted, the founding fathers could not have anticipated that we would face hostility from neighbouring countries and fight wars with them. While India wanted to mobilise all its resources for education and other development programmes, it had to divert resources to defence. Even now, Pakistan is being armed with all kinds of sophisticated modern weapons. In this situation, India cannot remain indifferent to this development and will have to strengthen its security. It is most tragic that, while all our resources should be utilised for education and other development plans for raising the standards of living of our people, we have to divert large sums towards military expenditure.

Although the Government has declared 1990 as the target date for universalising elementary education, considering the meagre amount of Rs. 8.50 crores which has been allocated in the budget of 1985-86 as central assistance to nine educationally backward states, it is most unlikely that the goal of universalisation will be reached by 1990. These nine educationally backward states hold among themselves 80.3 per cent of the total non-enrolled children of the 6-14 age-group.[3]

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[1] *The Education Quarterly*, Ministry of Education and Culture, Govt. of India, April 1984, p. 3.

[2] *Fourth All India Educational Survey*, NCERT, New Delhi, pp. 60-1.

The Planning Commission, in the Sixth Five Year Plan, had mentioned the main reason for the lack of progress in the implementation of Article 45 of the Constitution, viz. the unfavourable social and economic background of the parents who, because of their poverty, find it difficult to send their children to school. Thirty-eight per cent of Scheduled Caste children and 56 per cent of children of the Scheduled Tribes are not able to go to school. The most discouraging aspect of our primary education is that the current school drop-out rate is 76.6 per cent.[4] The children leave school before completing their basic education. It is sheer poverty that prevents children from taking advantage of educational facilities. They are required to give economic support to their parents either by grazing cattle or by looking after their younger brothers and sisters while the parents are out in the field.

The Constitution guarantees equality of opportunity and therefore it is imperative for the State to ensure that in the race for securing jobs, all the nation's children, whether they come from rich or poor families, should have an equal chance. In our society there are great disparities between the rich and the poor; and it is impossible for the children coming from poor families to compete with those coming from rich families. It is, therefore, necessary to apply what the Plowden Committee of the UK called the principle of "positive discrimination". The homes and neighbourhoods from which the poor children come provide little support and stimulus for learning, and therefore it becomes the duty of the schools to supply a compensating environment. In actual practice, however, we are far from achieving this ideal. We have a four tier system of education. There are exclusive public schools for those children who can afford to pay high fees. There are private schools in urban areas which are aided by Government and which cater to the needs of the middle and upper middle classes. Then there are municipal or government schools, both in urban and rural areas, which serve the poorest sections of society. The Government has recently established a fourth category of non-formal institutions for those children who cannot afford the luxury of either entering a school or who, if they manage to join a school, have to leave it within a year or two to help their parents in earning their livelihood. The Government also proposes to set up "model schools as pacesetter schools somewhat like seed farms". But it is again mostly the rich people who are likely to derive benefit from these schools. The present educational system thus tends to preserve, even to rëinforce, the existing structure of society instead of being an agent of social mobility. By providing education for their children in 'public' schools, the rich are able to secure for them high-salaried executive positions in business management, defence, the civil service and other professions. The middle classes have to remain satisfied with low-income professions, such as teaching, clerical or semi-skilled positions. The children of the most underprivileged who are not able to complete even primary education are doomed to work in factories or farms as manual labourers, even though they may not lack in intelligence.

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[3] *The Education Quarterly*, Ministry of Education and Culture, Govt. of India, April 1984, p. 4.

[4] Education Minister's statement in Parliament, *The Statesman*, 9 April 1985.

There is growing evidence that social class affects instructional achievement. Children coming from families in which parents occupy high positions have a better chance of achieving a higher level of achievement than those coming from the families of peasants or workers. The reason is that the children from the higher classes have the advantage of informational feedback which the lower class children lack. It is this "lack of cultural capital", as Pierre Bourdieu points out, which prevents the children of the lower classes—peasants and working classes—from proceeding to secondary and higher education.[5] If we are to provide equality of opportunity, we must raise the standards of the poorly equipped schools in the rural areas to the average national level. This means the Government must give top priority to bringing the schools in deprived areas to the level of the best schools in the country. This is a stupendous task, but the Government cannot ignore this responsibility if we are to give equality of opportunity to all the children of the nation.

Our experience of three decades has shown that the equalisation of educational opportunity cannot be achieved by merely opening free primary schools of indifferent quality. There is no comparison between the facilities which are available in public schools with highly qualified teachers, comfortable halls of residence, spacious playgrounds, nourishing food and well-equipped libraries and laboratories, and a single-teacher school in a village with a large number of half-starved and semi-naked students, with no library worth the name and no facilities for recreation and games. By no stretch of the imagination can we believe that the children coming out of a village primary school have the same opportunity to learn as the more fortunate children studying in 'public' schools or even in Government-aided, private schools in urban areas. Thus the present system, instead of functioning as an instrument of social change and social mobility, protects and upholds the privileges of the elite. While socio-cultural factors enhance the educational performance of the children of rich families, they depress the performance of the children of poor families. The net result is that the children of the affluent classes have access to higher positions in society and the children of poor families continue to remain in abject poverty.

The main hurdle in the universalisation of primary education is that of dropouts. During 1979/80 as many as 59.8 per cent of children dropped out of the school system by the end of the primary stage and 76.6 per cent by the end of the middle stage.[6]

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[5] Pierre Bourdieu in *The School as a Conservative Force, Scholastic and Cultural Inequalities in Schooling and Capitalism*, edited by Roger Dale and others, London and Henley, Routledge and Kegan Paul, in association with the Open University Press, 1976, p. 112.

[6] *The Statesman*, 29 January 1985.

The financial position of the backward states will have to be examined by the Central Government and necessary funds will have to be earmarked for the development of primary education in them. Democracy becomes meaningless if the children cannot read, write and do simple arithmetic and do not have a basic knowledge of citizenship which enables them to understand the operation of the Government. It should be the duty of both the state Government and the Central Government to ensure equal opportunity for all the nation's children so that they can function as efficient citizens, earning their livelihood and also participating actively in the democratic process.

A great handicap from which the children of the backward classes, particularly the tribal children, suffer is that of the language. The language used in the school is very different from the dialect which they use at home and in their community. They suffer from a double disadvantage. They not only find that the medium of instruction, the so-called mother tongue, is foreign to them, but the subject matter is also difficult to comprehend. Ivan Illich describes the radical change from the dialect to the language taught in school as the "switch from breast to bottle, from subsistence to welfare, from production for use to production for market". He further says that "the gradual replacement and degradation of the vernacular by its costly counterfeit heralds the coming of the market-intensive society in which we now live."[7]

Intelligence is equally distributed among all children, whether they come from urban or rural areas, but it is differences in linguistic ability and cultural background which often bring about differences in academic achievement. The majority of teachers also have an urban bias and do not understand the local dialect and have little sympathy for the children of deprived families. All these factors together force the children to drop out of school. It would therefore be desirable to introduce dialects in the early years of schooling and then gradually familiarise the children with the official language of the educational system. This experiment has been successfully tried in Peru and can be attempted in our rural schools also.[8] But since our dialects have not been subjected to linguistic studies, the problem is by no means easy. It will be necessary to develop appropriate teaching aids, such as textbooks, and to prepare teachers to apply new strategies. This would require a close cooperation between educators and linguists. Special classes will also have to be arranged for the tribal children so that they become familiar with the medium of instruction. This lack of linguistic ability, however, is only one of the factors which causes a serious impediment to the education of poor and tribal children.

If the students from rural areas are to be attracted and retained in school, the State will have to adopt various measures and provide auxiliary services such as school meals and milk, free supply of textbooks and stationery, provision of school uniforms, institution of stipends and scholarships, etc. The states of Andhra Pradesh and Tamil Nadu have already adopted the midday meal scheme. Recently, the Gujarat Government took a decision to launch a similar scheme. Other states will also have to adopt the midday meal scheme, and other support services, if the universalisation of education is to become a reality. It is estimated that two-thirds of all Indian children are affected by malnutrition, with more than half of these emerging into adulthood with noticeably impaired physical stamina, low productivity and stunted mental capacity.[9]

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[7] Ivan Illich: "Vernacular Values and Education", in *Teachers College Record*, Teachers College, Columbia University, Volume 81, Fall 1979, pp. 42-9.

[8] Gabriel Carron and Ta Nagoc Chau: *Reduction of Regional Disparities, The Role of Educational Planning*, International Institute of Educational Planning, The Unesco Press, Paris, pp. 105-6.

In addition to student support services, it will be necessary to improve the conditions of rural schools, particularly the single-teacher schools. At present, the whole atmosphere of the schools in rural areas—such as the quality of teachers, furniture and educational equipment—is so unattractive that it does not have the power to hold the children in the school. Instead of giving extra help to the educationally deprived children and discriminating in their favour, the present situation is hardly congenial to their physical and intellectual growth. It is, therefore, not surprising that they drop out soon after entering school. It is a mistaken belief that, by opening any kind of indifferent schools we shall be able to give equality of opportunity. Social justice demands that the schools in rural areas should be comparable to, if not better than, the best schools in the country. The Government should declare all poorly equipped schools as 'Educationally Priority Areas', as described by the Plowden Committee.[10]

Whenever we talk of the expansion or improvement of primary education, we are confronted with the problem of paucity of funds. It is true that there is a scarcity of funds; but whatever funds are available for education are also not being utilised in a planned manner. Higher education, as compared to primary education, has been greatly expanded, even though the rates of social return from secondary and general higher education are considerably less than those from primary and middle school education.[11] Studies have also been made in the United States which establish beyond doubt that the rate of return from college education is lower than that from elementary and secondary education.[12]

So, from whatever angle we examine the problem, the conclusion is inescapable that higher education should be restricted and the funds thus made available should be reallocated for the improvement of the quality of primary education. This will call for a total change in the strategy of educational planning. Now it is students from the high-income groups who receive the benefit of higher education. The demand for college enrolment comes from the top 5 to 10 per cent of the highest income groups, who are spending over Rs. 100 per capita per month. The remaining 90 per cent of teenagers cannot afford to pay for their fees, books and college-level clothes.[13] There is no reason why the highest income group who derive the most benefit from higher education should not meet the major part of the cost of their education. The Government should institute scholarships only for poor and deserving students. There can be no equality of opportunity unless the socio-economic structure of society undergoes a radical change and the home environment of the children coming from rural areas becomes comparable to the home environment of children coming from affluent families. Nearly 50 per cent of our people live below the poverty line and are able to eke out their existence only under extremely difficult circumstances. The present atmosphere of rural homes in which most Indian children grow up is not conducive to their education.

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[9] *The Statesman,* New Delhi, 15 December 1984.

[10] *Children and their Primary Schools,* The Central Advisory Board of Education in England, His Majesty's Stationery Office, p.57.

[11] Blaug Mark: *An Introduction to the Economics of Education,* Allen Lane, The Penguin Press, London, 1970, pp. 240-1.

[12] Walter L. Garms and others, 'School Finance' *The Economics and Politics of Public Education,* Prentice Hall, Inc., 1978, pp. 56-8.

There is enough evidence, both in India and abroad, that the differences in the school achievement of children from different social classes are due mainly to their socio-economic background.[14] The children of poor and illiterate parents enter school with a serious handicap. It is not enough to provide educational facilities by opening elementary schools; simultaneous steps have to be taken to improve the social and economic conditions of the people who are living below the poverty line. While one must appreciate the gigantic efforts which the Government has made for the expansion of primary education since Independence, the percentage of the unemployed and of those living below the poverty line has considerably increased; the disparities between the rich and the poor have also increased. The latter are living under the most wretched conditions and lack the physical, social and cultural conditions which would be conducive to their chilren's education. This is why children coming from poor families are not able to take full advantage of even the existing educational facilities. While the Government has given considerable relief to the Scheduled Castes and Scheduled Tribes by instituting stipends and scholarships for the education of their children, it is now time that Government seriously considered extending similar facilities to other economically deprived sections of society.

Another remedial measure which the Government should adopt for attracting children from deprived areas is to send the best teachers to the schools in rural areas. Instead of doing this, the Education Departments usually transfer the least qualified teachers to those schools. Sometimes, inspectors transfer teachers to schools in remote areas as a measure of punishment. The rural schools are thus neglected in various ways. They thus not only have poor, dilapidated buildings and lack necessary educational aids and equipment but also suffer on account of the poor quality of teachers who are the least interested in encouraging children to take their studies seriously. The Education Departments will have to change their policy with regard to the recruitment of teachers for schools in deprived areas. Teachers should be given an additional allowance for serving in rural areas. Those serving under difficult conditions should receive special recognition and reward. In this connection mention must be made of a major problem teachers face in rural areas. In villages, proper houses where teachers could live in reasonable comfort, are not easily available. Therefore, when a school building is being constructed, quarters for the teachers and their families must form an essential part of it.

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[13] Satish Saberwal: 'Education and Inequality' in *Economic and Political Weekly*, Vol. VII, 1972, p. 409.

[14] Surabhi P. Patel: *Equality of Opportunity*, National Publishing House, Delhi, 1983, pp. 74-7; and Walter L. Garms and others, op. cit., p. 60.

To reach the goal of universalisation of elementary education and at the same time bring about equalisation of opportunity, we have many miles to go. The journey is long and arduous and we may not reach the goal even during the 21st century. But if democracy is to be meaningful, a sincere effort has to be made to provide equality of opportunity to every child, irrespective of caste, sex, religion, and social background. For too long have our people been the victims of social discrimination and economic injustice; and, if social conflict is to be avoided, we must take urgent steps to rectify this injustice. This may take years but a political decision has to be taken and we must move step by step towards the goal. This is the greatest challenge to Indian democracy.

MOONIS RAZA
YASH AGGARWAL

An Analysis of Inequities in the Levels of Literacy in India

Moonis Raza

Yash Aggarwal

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An Analysis of Inequities in the Levels of Literacy in India

ALPHABETISATION PROVIDES THE BASAL STRATUM FOR THE MULTI-level educational pyramid. It may, therefore, be viewed as an important input in and as vitally linked with the totality of the development process. The spatial patterns of alphabetisation and of the regional variations therein acquire special significance in this context as strands in the fabric of imbalances as well as inequities in national development. The differential spread of literacy can, therefore, be properly analysed as an element in the system of interdependencies having bi-directional linkages with the development process. In consonance with the marked disparities in socio-economic conditions across regions in India, the level of and response to educational opportunities also vary in space; and, as a consequence, certain regions acquire relative advantage over others in terms of human resource development and human capital formation.

It is significant to note that a rise in the level of literacy rate does not necessarily result in the narrowing down of intra- and inter-regional disparities therein, at the different stages of development. The variations in the magnitude of inequities between binomial elements of a region may follow the path of 'divergence-stability-convergence' in relation to the different stages of rise in literacy rate. One should be cautious in generalising this dynamic relationship and should not draw normative generalisations from historical behaviour. It may also be noted that the exact shape of the curve would vary from situation to situation and each of these would call for a different set of policy measures in educational planning and resource allocation. Whether literacy is looked upon as an input in the development process or as its consequence, the crucial step in the analysis of its spread across national space, therefore, does not consist in the futile search for an ideal growth curve; but rather in the identification and explanation of the inter- and intra-regional differentials in its levels on the basis of which suitable policy measures to ensure that growth accompanies equity might be taken.

The basic thrust of the development models during the first and second Development Decades was on growth, for example, *a la* Harrod-Domar model. The limitations of 'growth' models as tools of socio-economic planning in the context of the developing economies of the third world became evident during the 1970s as the 'growth' of many developing countries was not only slow and failed to usher in the desired results but was also accompanied by the accentuation of intra- and inter-regional disparities. It is in this context that the emphasis in planning has shifted from 'growth' to 'growth with equity', which is now considered to be the major goal of social planning in many developing countries. It may be noted that there is no contradiction between the demands for equity and growth. Equity without growth is a stagnant cesspool wherein only misery, ignorance, obscurantism and superstition can be equitably distributed. Growth without equity leads to the accentuation of the structural disequilibrium which constrains growth itself. The social concern for the two can be handled together, sustaining and sustained by each other. In the educational sector such an approach acquires added significance, not only as a moral commitment to the deprived but from the viewpoint of nation building itself.

Universalisation of alphabetisation has been one of the major concerns of the educational and social planners of the third world during the later half of the present century. The achievement of this objective would have automatically reduced by now the intra- and inter-regional disparities to zero, particularly at the basal stratum of the multi-level educational pyramid. The reality is, however, quite disheartening. In spite of serious attempts made in many third world countries, there are still miles to go before illiteracy is eradicated and, as a consequence, disparities in its levels have continued to persist. During the 1971-81 decade about 28 million adult illiterates, of which 22 million are in rural areas, were added to the existing stock of about 210 million illiterates in India. The results of a Unesco (1978) study, have revealed that, in India, the literacy rate is likely to increase to about 55 per cent only by 2000 AD and that the overall gap in the literacy rates of males and females would fall only marginally. Unless some serious efforts are made to tackle this situation, intra- and inter-regional disparities may well persist up to 2000 AD. The temporal stability of illiteracy has been, therefore, recognised as a constituent element of under-development, especially in the third world. The persistence of inequities as well as low rates of growth of literacy therein are largely the composite effect of the distortions embedded in the social system during colonial rule, on the one hand, and of the infirmities and limitations of the current developmental strategies to bring the country out of the inherited slough, on the other.

India exemplifies a polity where wide regional disparities in socio-economic development and a distorted economic base are characterised by low levels of literacy. Universalisation of alphabetisation in the Indian context was, therefore, recognised as a crucial input in nation building as well as modernisation and it was in this context that the founding fathers of the Indian Constitution not only considered free and compulsory elementary education as a major goal of educational policy but also called for strategies of educational development which would achieve this target within the first decade of planned development. Consequently, the First Five Year Plan

(1951), while taking note of the existing inter-regional imbalances, underlined the need for an equitable distribution of educational opportunities in specific terms and referred to it as one of the major targets of educational planning in the country. Table 1 presents the trends in male-female literacy rates and the continued persistence of inequities between them is quite evident.

TABLE 1

Literacy Rates in India : 1901-81

(Percentage of total population)

Year	*Total Persons*	*Males*	*Females*
1901	5.35	9.83	0.60
1911	5.92	10.56	1.05
1921	7.16	12.21	1.81
1931	9.50	15.59	2.93
1941	16.10	24.90	7.30
1951	16.67	24.95	7.93
1961	24.02	34.44	12.95
1971	29.45	39.45	18.69
1981	36.23	46.89	24.82

It was once held that the low levels of literacy in the country are the result of the uneven spread of schooling facilities, particularly the gross neglect of the rural areas in this respect. It was, therefore, hoped that the phenomenal growth of educational facilities in the rural areas would be an active instrument for the minimisation of inequities in this sector. Towards the end of the Second Five Year Plan it was realised that it would not be possible to achieve the targets of socio-economic development without raising levels of literacy. It was in this context that the Third Five Year Plan called for a pooling of resources in men and money. The National Policy Resolution of 1968 called for a strategy of educational development to correct regional imbalances and to reduce disparities through extensive programmes of adult education. Provision for school education was made in the successive Five Year Plans in pursuance of these goals; and, more particularly, special incentives were provided for the deprived strata of society.

The Second All India Educational Survey (1965) noted that 94.96 per cent of the rural population has access to a primary school within a distance of 1.6 km. The results of the subsequent surveys have shown that the accessibility factor has continued to be quite high during the last two decades. The corresponding figures for the Third and Fourth All India Educational Surveys are 92.65 and 95.02 per cent respectively. But if we look at the situation in terms of social and not just physical space, the inadequacies of the accessibility factor come into sharp focus. The contour map of social space shows deep depressions in association with high ridges. The data on the location of schools in rural habitations (Fourth All India Educational Survey) has revealed that only 31 per cent of Scheduled Caste habitations have a primary school as compared to nearly 47 per cent for all habitations. The position with regard to the location of middle schools is also not very different. It has been observed that only 3.5 per cent of Scheduled Caste habitations have a middle school/section as compared to 10.7 per cent for the general population. Nearly 80 per cent of rural habitations have primary schools either within the habitation or up to a walking distance of 1 km.

It follows from the above, that physical accessibility to schooling facilities, even in rural areas, may not now be considered to be a major hindrance in achieving the target of cent per cent enrolment. However, it is now being increasingly realised that *physical accessibility* and *social availability* need to be distinguished from one another. While the former is achieved through minimising the friction of distance, the latter calls for structural changes in the socio-economic set-up. It is in this context that a narrow sectoral approach to educational development has not yielded the desired results, for the causes of low enrolment are rooted deeply in the socio-economic structure itself. That is why the massive efforts to correct different types of imbalances in the spread of primary education have not produced the desired results and the situation continues to be highly unsatisfactory. Literacy statistics reveal that during the seventies the net addition to population has been nearly one and half times that of the net addition to the number of literates. The position in respect of deprived sections is far more serious.

It is, therefore, surprising that these aspects of identification, measurement and explanation of the inequities in the sphere of education have not been adequately probed either by the social scientists or by educational planners. Concerned scholars have been almost entirely preoccupied with the socio-economic correlates of disparities in a wonderland without space; and its regional dimension has not been duly recognised. This is particularly unfortunate because the problems of inequities are deeply rooted in the regional sub-system of interdependencies and can, therefore, be satisfactorily analysed and remedial action for their minimisation effectively undertaken only within a regional frame.

It is only during recent past that a few halting steps have been taken in this direction. A systematic attempt to measure the nature and patterns of regional disparities in education was made in a series of studies sponsored by the International Institute of Educational Planning (Carron and Ngoc 1980). The relationship between intra- as well as inter-regional disparities in education and the process of socio-economic development was illustrated with the help of specific case studies, which made use of a number of innovative tools in the diagnosis of the existing malaise. A comparative study of male and female illiteracy in the world has shown that the magnitude of disparities between the sexes is very high in some cases and that this attribute would continue to persist. Reference may be made to the fact that in a number of countries—Chad, Ethiopia, Mali, Niger, Somalia and Upper Volta in Africa as well as Afghanistan, Saudi Arabia and Yemen in Asia—the female literacy rate was close to the zero mark as late as in 1971 (Unesco, 1980).

Ryba (1979) examined the territorial aspects of educational inequality on a world scale by considering educational provisions in relation to educational achievements. He showed that territorial inequalities are noticed at every scale of analysis and that these have tended to persist over time. Williamson's (1977) study on the patterns of educational inequality in West Germany validated the hypothesis that educational inequalities are deeply rooted in the social milieu and continue to constrain development even in the otherwise developed countries of Europe.

A number of studies on the nature and the patterns of inequities in the context of Indian literacy have been undertaken by scholars during recent years. A comparative study on the nature and patterns of inequities in literacy rates between 1961 and 1971 has been undertaken by Kundu and Rao (1982). The study is based on the state as the unit of analysis. Inter-state differences in the rural-urban literacy rates have been examined for the year 1981 (D'Souza, 1982). The study has probed the nature of association between rural-urban disparities with urbanisation, on the one hand, and with industrialisation, on the other. Ahmad (1982) has examined inter-district inequities in literacy rates of the tribal population of Bihar for the year 1971. These studies have noted converging trends and the narrowing down of disparities in literacy rates.

Usha Rao (1982) has studied the intra-state disparities in literacy rates for the Scheduled Caste population in Karnataka. A probing study into variations in the literacy rates of Gujarat and some of the economic correlates of the same has shown that the proportion of agricultural workers in the rural work-force exerts a significantly strong influence on literacy rates in the selected villages (Shah, 1981). It may thus be noted that the studies undertaken in the Indian context have noted a converging trend and a narrowing down of disparities in literacy rates of different regions as well as different strata of the society.

One of the serious limitations of the studies on India, referred to above, lies in the fact that the disparities have been examined either with states as the unit of analysis or within districts or similar sub-regions of only one state. It may be noted that states as units of analysis for examining different aspects of regional disparities would be quite unsuitable because of their heterogeniety both in terms of elements of diversity and disparity. It may not give any meaningful result if we club Chota Nagpur Plateau with the North Bihar Plains or the Gujarat plains with Saurashtra. Quite a few of the studies undertaken by economists assume away these diversities, which render their conclusions of doubtful validity. The same can be said with equal force about the magnitude of disparities within the boundaries of a state. How does one, at any level of rationality, club together Jaisalmer and Jaipur, Burdwan and Siliguri, Bangalore and Gulbarga, Hyderabad and Mahboobnagar, or Meerut and Ghazipur? The only alternative is, therefore, to consider the district as the unit of analysis. The district, as an administrative unit of the Indian polity has a particular vitality which is the function of its sociological homogeniety, dialectal uniformity and historical continuity. It is at this level that the macro processes get rooted into the micro worlds, providing the unity in diversity of the Indian ethos. It is at this level that the emphasis shifts from the system of vertical linkages of sectoral planning to the system of horizontal linkages of regional planning. This is particularly true of the sphere of educational development, wherein specificity and universality are intrinsically linked together.

It must, however, be recognised that these pioneering studies have brought out the need for and showed the path towards detailed empirical investigations at a disaggregated level. As a response to this need, an attempt has been made here to examine the inter-relationships between economic base, levels of literacy and different types of inequities in literacy rates on the basis of a cross-section of districtwise data. A comprehensive set of data pertaining to literacy and some related aspects of socio-economic development are collected every ten years on a Census basis in India. The present study makes use of this valuable source for the year 1981.

In the context of the present study, three different situations may be visualised:

1. a phenomenon is unequally distributed across spatial units, e.g. literacy rate across districts;
2. a universe may have two components and the value of a selected attribute may be unequal for the two in the same spatial unit, e.g. male and female literacy rate in a district; and
3. the disparity between two components of a universe relating to a selected attribute may be unequally distributed across spatial units, e.g. male-female disparity in literacy levels across districts.

In the light of the data availability, we have identified the following six groups for the measurement of disparities in literacy rates:

1. male-female
2. rural (male-female)
3. urban (male-female)
4. rural-urban
5. male (rural-urban)
6. female (rural-urban)

In the present exercise, the disparity indices were calculated by using a modified version of Sopher's index which takes the following form (Raza and Aggarwal, 1983):

$$w = \log (L_2/L_1) + \log [(100+I_1) \ / \ (100+I_2)] \quad L_2 > L_1$$

where L_1 and L_2 are the literacy rates and I_1 and I_2 are the corresponding illiteracy rates for the two elements between which the disparity index is to be calculated.

Keeping in view the framework of the present study and the availability of data, the following attributes of the economic base of the district have been selected:

X_1 = Per cent total literacy
X_2 = Disparity index of male-female literacy
X_3 = Disparity index of rural (male-female) literacy
X_4 = Disparity index of urban (male-female) literacy
X_5 = Disparity index of rural-urban literacy
X_6 = Disparity index of male (rural-urban) literacy
X_7 = Disparity index of female (rural-urban) literacy
X_8 = Per cent agricultural labourers
X_9 = Per cent cultivators
X_{10} = Per cent other workers
X_{11} = Per cent rural literacy
X_{12} = Per cent urban literacy
X_{13} = Per cent urban population

It may be noted that the definitions of the variables X_8, X_9, X_{10}, X_{11}, X_{12} and X_{13} are the same as in the Census of India, 1981.

The relationships of disparity indices with literacy rates, on the one hand, and with economic base indicators, on the other, have been examined through regression analysis. By using the rate of urbanisation as an explanatory variable, it became possible to draw some interesting conclusions about the difference between the urban and rural areas with regard to the levels of literacy as well as to inequities in the incidence of literacy.

Five aspects of inequities

The inequities and distortions embedded in the socio-economic structure in many of the newly independent countries are deeply rooted in their historical processes and particularly in their colonial heritage. Since the dawn of civilisation, education and development have been intrinsically linked through bi-directional causality. Inequalities between the educational levels of different groups have been both the cause and the effect of the differentials between their levels of socio-economic development. This is specially true of the levels of literacy, which provides the essential precondition for educational development. While in the developed countries of today, the industrial revolution had created conditions wherein the need for a literate work-force had slowly and steadily led to universalisation of literacy, the accompanying process of the development of underdevelopment in the colonial empires necessitated the persistence of inequalities in the levels of literacy and of illiteracy in the case of the mass of the people.

The requirements of colonial rule thwarted the economic development of colonial countries, acted as an impediment in the path of technological advances in agriculture, did not permit the emergence of a self-reliant industrial sector; and consequently acted as a serious constraint on inter-sectoral transfer within the work-force from the primary to the secondary sector—at best, permitting the development of underdevelopment. While the collapse of the handicraft-based secondary sector led to the overburdening of the technologically stagnant primary activities, the needs of colonial administration were met by a bloated tertiary sector, which was divorced from and contemptuous of work. The socio-economic conditions, which had led to the narrowing of the gap between work and education in the developed countries of today in the wake of the Industrial Revolution, were thus not allowed to emerge in the countries of the third world.

Let us recapitulate the socio-economic context within which the present-day disparities in the educational system have emerged on the Indian scene. The following five forms of relative deprivation and the consequent categories of disparities may be identified:

1. between Scheduled Castes and others;
2. between Scheduled Tribes and others;
3. between males and females;
4. between rural and urban settlements; and
5. between developed and less developed regions.

Let us probe a little into the genesis of these disparities.

First, the disparities between Scheduled Castes and others emerged as a consequence of the historical separation of work from knowledge and from power. The Scheduled Caste work-force is mainly concentrated in the primary sector, which, in the context of under-development, calls for lower levels of skills, which can be carried out on the basis of traditional skills without exposure to modern means of production.

An enquiry into the distribution of work-force (main workers) based on 1981 Census data has revealed that the participation rate in the work-force in the case of Scheduled Castes and Scheduled Tribes is quite high as compared to the non-scheduled population; it is 42.5 per cent for Scheduled Tribes; 36.1 per cent for Scheduled Castes and 32 per cent for the non-scheduled population. This may be partly explained by early induction in the work-force in place of schooling and later, or no retirement. This further gets corroborated by the fact that most of the work-force is engaged in the primary sector of the economy, as agricultural labourers. The data pertaining to 1971 Census has indicated that nearly 80 per cent of the Scheduled Caste workers were engaged in the agricultural sector and nearly 52 per cent of them were agricultural labourers. The corresponding share for the non-scheduled population was 65 per cent and 20 per cent respectively. There was no significant change during the seventies. The distribution of workers in the nine groups for 1981 is not yet available.

It is a well known fact that most agricultural workers are illiterate and live under miserable conditions, below poverty line. Another notable aspect of the distribution of work-force is that, in 1971, the share of Scheduled Caste workers in the organised manufacturing sector was only 3.5 per cent, as compared to nearly 7 per cent for the non-scheduled workers. In the organised sector, because of their low levels of education, they are usually engaged as semi-skilled workers.

The persistence of disparities in literacy between Scheduled Castes and others is evident from Table 2. The relative deprivation of Scheduled Caste population in the sphere of literacy at the district level has been brought out by considering those districts in which the share of rural Scheduled Castes to total rural population is 5 per cent or more. In 1971, out of a total of 356 districts in the country, 286 satisfied this criterion and were labelled as predominantly Scheduled-Caste districts. It is interesting to observe that the Scheduled Caste literacy rate was less than 12 per cent in as many as 131 districts as compared to the fact that there was no district which had less than 12 per cent literacy for non-scheduled population.

It may be noted that the data presented above relates to the aggregate picture at the national level. The situation with respect to a large part of the rural and hinterland is much more alarming as the distribution is highly distorted and inequitious there.

TABLE 2

Literacy Rates

	Scheduled castes		*Non scheduled*	
	1971 %	*1981* %	*1971* %	*1981* %
Total population	14.67	21.38	33.80	41.30
Male	22.36	31.11	44.48	52.35
Female	6.44	10.93	22.25	29.43
Rural population	12.77	18.48	27.51	34.22
Male	20.04	27.91	38.10	46.14
Female	5.06	8.44	15.88	21.68
Urban population	28.65	36.60	55.06	60.39
Male	38.93	47.54	63.73	68.46
Female	16.99	24.34	44.93	51.19

Second, the disparities between Scheduled Tribes and others are rooted in the continued isolation of some tribal communities within *culs-de-sac* in hilly, forested or arid terrains. The low levels of educational development, the regional strains and stresses that still persist, are the consequence of the different levels of development between the tribal and the adjacent non-tribal communities and the strains can be eliminated only by minimising such disparities. The 1981 Census results show that the overall literacy rate among the Scheduled Tribes was only 16.3 per cent as compared to 36.23 per cent for the whole population. Among the Scheduled Tribes, the rural female literacy rate was only 8.4 per cent as compared to 47.5 per cent for urban males.

Third, the disparities between male and female educational development are rooted in the persistence of some attributes of the spurious modernisation of the colonial era. This expresses itself quite sharply in the denial of educational opportunities to women. The relative deprivation of women in the field of education is particularly significant because it underlines all other attributes of deprivations. The Scheduled Castes were deprived, no doubt; but the Scheduled-Caste women were more deprived than their menfolk. The doors of the educational institutions were closed to women as an integral part of the backward-looking colonial policy of buttressing the obscurantist male chauvinistic tendencies in the polity. The persistence of a low level of female literacy is evident from the fact that it increased from 0.60 per cent in 1901 to only 7.3 per cent in 1941. The rural population was deprived, no doubt; but rural women were more deprived than their menfolk. The rural Scheduled Caste female literacy, even after 25 years of independence, was less than 1 per cent in as many as 73 districts and less than 2 per cent in 116 districts out of a total of 286 with rural Scheduled Caste population of more than 5 per cent of total rural population. A movement for women's education in the Indian social context is, therefore, very much more than a movement for women's education. It strikes at the very roots of the passive system of social inequities intertwining the Indian polity, continuously sucking out its lifeblood and rendering it anaemic and weak. Women's education is an instrument of liberation, not only of women but of Indian society as a whole.

Fourth, the persistence of disparities in the rural-urban continuum can be traced to the spatial organisation of underdevelopment. The colonial process, which not only affected the qualitative but the quantitative attributes of educational development as well, was embedded in the space economy. It is only by correcting the spatial distortions introduced and/or strengthened during the colonial era that the limitations and infirmities of the present-day development programmes can be properly understood. The colonial processes of spatial articulation, which were strongly embedded in the space economy, effected both the qualitative and quantitative attributes of urbanisation. In the educational sector, the ability of the colonialists to play the dominant role was considerably strengthened, firstly, by creating educational opportunities which formed the basis for the adoption of modern means of production, and secondly by creating a variety of job opportunities in productive sectors of the economy located therein. A reference may be made in this context to the fact that, in 1931, the literacy rate in the 34 largest cities was 34.8 for males and 14.9 for females as compared to 13.3 and 2.5 respectively for India as a whole. The gap between rural and urban literacy was, therefore, extremely wide.

Fifth, the persistence of regional imbalances and inter-regional disparities are reflected in a constricted industrial base and proliferation of the tertiary sector, which by and large is non-productive. The relationship between the vertical shifts in the work-force, on the one hand, and its horizontal mobility, on the other, is of crucial significance in the development process. The exogenous imposition of modern industry on the traditional economy was almost entirely concentrated in a few large cities—generally in port conurbations, which acquired the character of islands in a vast ocean of technological backwardness in the countryside. The port towns, unlike their counterparts of the ancient and medieval periods, served as the focal points of a suction mechanism and became the centres for the export-import oriented commodity flows. These processes have led to the emergence of regional disparities in educational development as well. The 1981 literacy rate varies from 6.94 per cent in the case of East Kameng in Arunachal Pradesh to 81.35 per cent in Kottayam district of Kerala.

It is significant to note that all these strands do not operate separately. They are intrinsically intertwined in the thick rope of the socio-economic oppression which ties down the social system. As we move down from the high caste, male and urban in relatively developed regions to Scheduled Castes and tribes, female and rural in relatively less developed regions, the inequities become more and more sharp. The pyramid of inequities at the aggregate level is shown in Figure 1 on page 110.

The results of the 1981 Census show that the literacy rate varies from 90.33 per cent for non-Scheduled Caste, urban male population in Kottayam district of Kerala to 0.23 per cent for Scheduled, rural female population in the Jaisalmer district of Rajasthan. The cumulative frequency distribution of districts corresponding to different levels of literacy is presented in Table 3 (see page 112) and represented in Figure 2 on page 111. It has been observed that 211 districts have less than 15 per cent literacy among rural females while in no district is the urban male literacy less than 35 per cent. It is, therefore, evident that the identification, measurement and explanation of disparities between the literacy levels of different binomial elements constitutes the first step towards formulation of policies and programmes for reducing the inequities to a zero level.

Regional disparities and characteristics of the economic base

Planning in independent India has been aimed at altering the inherited socio-economic structure through massive public investment in vital sectors of the economy. However, even after 30 years of planned development, many characteristics of underdevelopment have continued to persist. A systematic understanding of these relationships is of crucial significance not only for regional planners of the educational sector alone but of economic development as a whole. This is particularly so if we recognise that education is bidirectionally linked with the development process. We will make some exploratory investigations into the nature of these relationships in this section. The relationship of disparity indices with the levels of literacy, as well as with economic base indicators, will be examined in some depth. A preliminary exploration into the nature of these relationships has been attempted through the examination of a correlation matrix which is presented in Table 4 (see page 113). Some important conclusions that emerge from a study of this table are discussed below:

1. It is obvious that the level of literacy is significantly and negatively associated with all the six types of disparity indices. In view of the negative

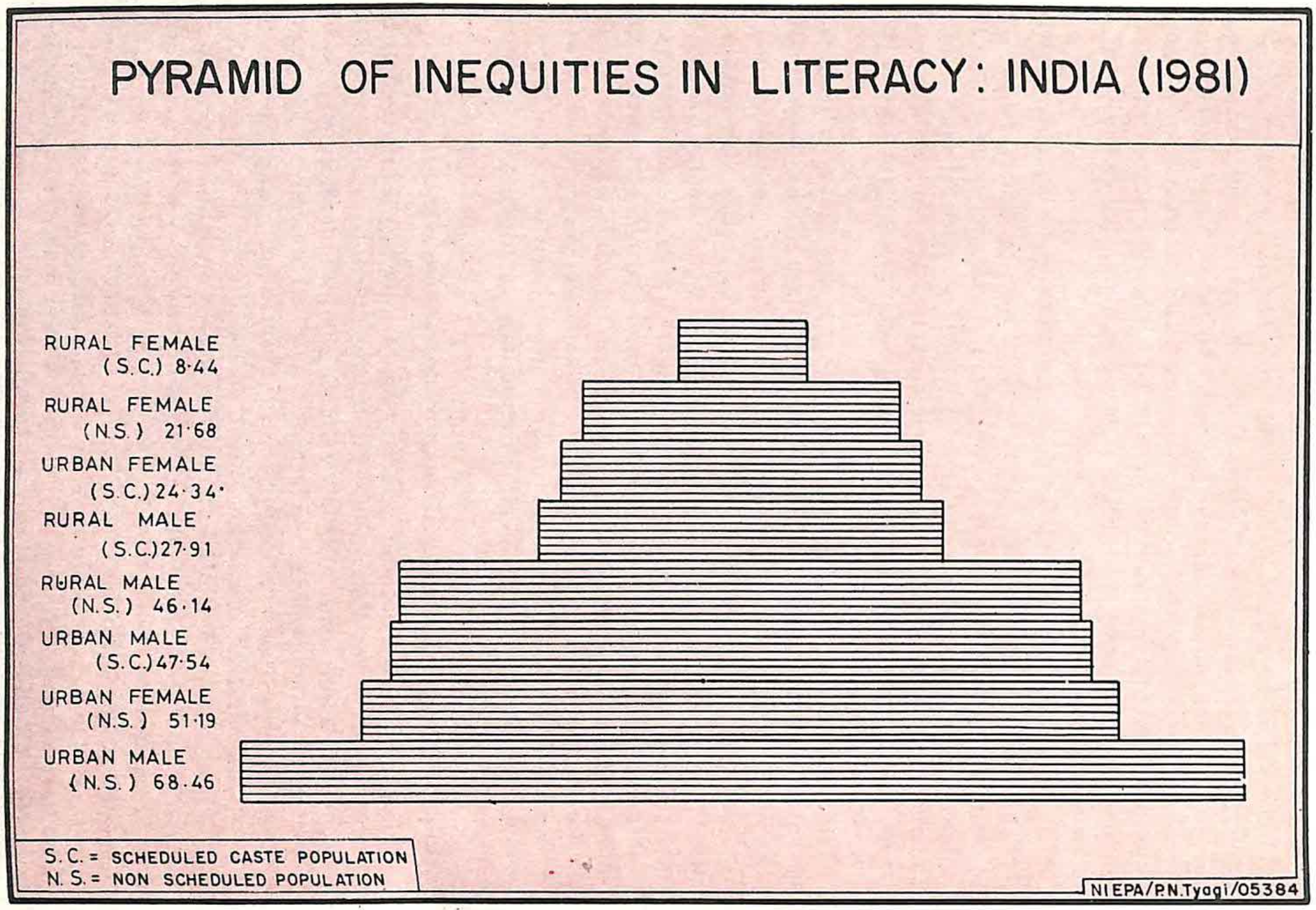
PYRAMID OF INEQUITIES IN LITERACY: INDIA (1981)
RURAL FEMALE (S.C.) 8·44
RURAL FEMALE (N.S.) 21·68
URBAN FEMALE (S.C.) 24·34
RURAL MALE (S.C.) 27·91
RURAL MALE (N.S.) 46·14
URBAN MALE (S.C.) 47·54
URBAN FEMALE (N.S.) 51·19
URBAN MALE (N.S.) 68·46
S. C. = SCHEDULED CASTE POPULATION
N. S. = NON SCHEDULED POPULATION
NIEPA/P.N.Tyagi/05384

Fig. 1

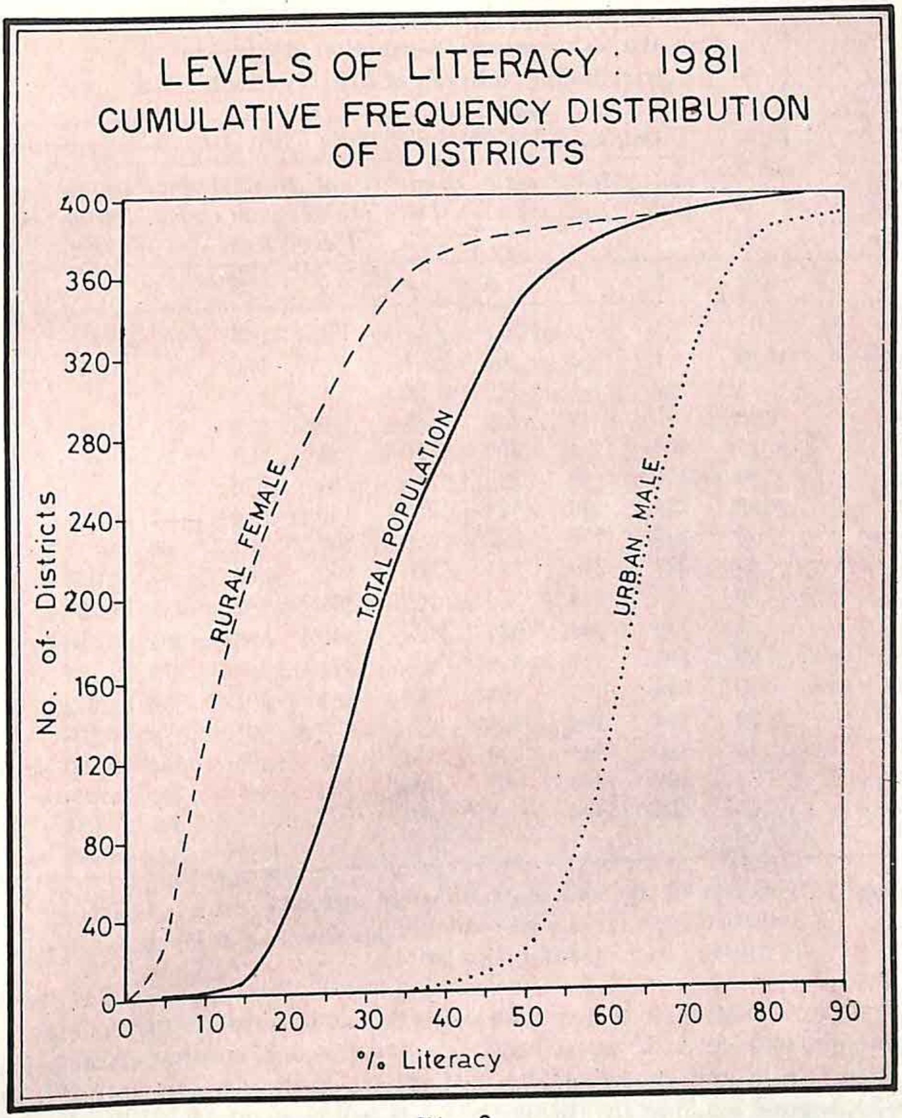

Fig. 2

association, the districts with low levels of literacy tend to have high levels of disparities and vice versa. These inter-relationships further reveal that, in the Indian context, the diffusion of literacy has been accompanied by a corresponding reduction in the magnitude of disparities. It follows that there is no contradiction between equity and growth. In the case of educational development, growth has thus been by and large accompanied by equity.

2. In view of the rural dominance in the population of the country, rural literacy emerges as the major determinant of the level of overall literacy and is also significantly related to different types of disparity indices. The

TABLE 3

Cumulative Frequency Distribution of Districts Corresponding to Levels of Literacy : 1981

Sl. No.	*% Literacy*	*Cumulative frequency distribution of districts corresponding to*								
		Total[1] Lit.	*Male Lit.*	*Female Lit.*	*Rural[2] Lit.*	*Rural Male Lit.*	*Rural Female Lit.*	*Urban[3] Lit.*	*Urban Male Lit.*	*Urban Female Lit.*
1	2	3	4	5	6	7	8	9	10	·11
01	<05			7			28			
02	<10	1		65	3		136			
03	<15	7	1	149	26	2	211			
04	<20	40	2	209	89	8	255			1
05	<25	105	14	254	170	33	303			16
06	<30	178	43	297	235	84	339	2		42
07	<35	234	96	328	282	146	362	7		95
08	<40	279	159	352	325	208	374	26	3	158
09	<45	321	215	374	360	265	380	67	10	221
10	<50	353	265	380	375	309	382	135	21	272
11	<55	374	308	384	381	346	383	204	56	322
12	<60	383	355	389	383	373	388	277	124	361
13	<65	388	375	395	388	384	391	338	212	375
14	<70	394	389	396	391	388	393	373	306	382
15	<75	399	393	400	394	390	395	384	360	388
16	<80	401	399	402	396	395	397	391	386	391
17	<85	402	402		397	397		392	391	392
18	<90								392	

Notes: 1. The data for the State of Assam is not included.
2. 5 districts have no urban population.
3. 10 districts have no rural population.

correlation coefficient between total literacy and rural literacy is 0.843 as compared to 0.552 with urban literacy. It may thus be noted that, in the Indian context, the growth of overall literacy has been essentially constrained by the slow progress made in the diffusion of literacy in rural areas.

3. A close association has also been observed between the indices of literacy and the economic base of a district. An examination of Table 4 shows that the correlation coefficient between the literacy rate and the proportion of cultivators is both negative and significantly high(−0.605). Thus, the districts which are mainly dependent on agriculture have low levels of literacy. This evidence clearly shows that literacy among the rural masses is of crucial significance in the process of modernisation of the agricultural sector and diversification of the rural economy.

4. The correlation coefficient between proportion of workers engaged outside the traditional combination of primary activities and household industries is significantly and positively related to the levels of literacy, on the

TABLE 4

Inter-correlation Table

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}
X_1	1.000												
X_2	-.805	1.000											
X_3	-.744	.911	1.000										
X_4	-.622	.757	.728	1.000									
X_5	-.695	.519	.612	.498	1.000								
X_6	-.667	.420	.492	.457	.957	1.000							
X_7	-.718	.686	.816	.606	.934	.856	1.000						
X_8	-.040	-.003	-.062	.165	.008	.037	-.052	1.000					
X_9	-.605	.526	.439	.275	.361	.324	.389	-.484	1.000				
X_{10}	.713	-.605	-.468	-.461	-.422	-.399	-.416	-.251	-.707	1.000			
X_{11}	.843	-.674	-.668	-.540	-.664	-.635	-.697	.063	-.393	.398	1.000		
X_{12}	.552	-.455	-.392	-.236	.044	.034	-.064	.002	-.290	.316	.440	1.000	
X_{13}	.523	-.449	-.262	-.215	-.240	-.244	-.200	-.115	-.622	.771	.096	.204	1.000

X_1 = Percentage total literacy
X_2 = Disparity index of male-female literacy
X_3 = Disparity index of rural (male-female) literacy
X_4 = Disparity index of urban (male-female) literacy
X_5 = Disparity index of rural-urban literacy
X_6 = Disparity index of male (rural-urban) literacy
X_7 = Disparity index of female (rural-urban)
X_8 = Percentage agricultural labourers
X_9 = Percentage cultivators
X_{10} = Percentage other workers
X_{11} = Percentage rural literacy
X_{12} = Percentage urban literacy
X_{13} = Percentage urban population

one hand, and negatively associated with the different types of disparities, on the other. The inherited economic base of low technology production processes is essentially inadequate and incapable of either generating and supporting processes of social change through increase in literacy or the narrowing of the inequity gaps.

5. Urbanisation is associated with the raising of literacy rates and the lowering of the disparities therein. This may be attributed to the fact that there is a stronger tendency amongst the literates to migrate from the rural to the urban areas and to the strong urban bias in the provision of facilities for formal as well as non-formal education. The exact nature of the magnitudes of these relationships, however, need to be examined in greater detail.

6. The value of the correlation coefficient between different indices of disparities and rural literacy is higher than the corresponding values for urban literacy. This may be attributed to the fact that the intensity of social inequities, particularly those of the caste system and of male dominance, is higher and more deeply entrenched in the rural ethos than in the urban.

It follows from the above that there are strong associations between the indicators of literacy disparities and the economic base characteristics of a district, that they are intrinsically intertwined. On the basis of these findings, it was considered desirable to probe deeper and to examine the causal relationships between the indicators of regional disparities and those of economic base with the help of simple linear regression analysis. The disparity indices and literacy rates have been considered as the dependent and the indicators of economic base as the independent variables. The causal relationship between literacy rate as the independent and the disparity indices as the dependent variables have also been examined in a similar manner. The main findings of the analysis are presented below.

Literacy, disparities and economic base characteristics

The percentage share of workers engaged in activities other than those of the traditional sector of primary production in symbiosis with household industry, and particularly that of modern manufacturing, constitutes the economic base indicator which significantly explains variations in total literacy. It is the strength of the non-primary sector of the economic activity which emerges as the major determinant of the literacy rate. The estimated regression equation is as under:

$$X_1 = 19.23 + 0.544X_{10} \qquad R^2 = 0.509$$

The total explanatory power of the equation set out above is about 51 per cent and the positive sign of the regression coefficient indicates that the level of literacy and the proportion of workers in the non-primary sector of the economy co-vary in the same direction. It may, however, be noted that the relationship between literacy and the economic base is quite complex. After all, literacy alone may not be an adequate measure of all the technical skills required in different sectors of the economy. Nevertheless, the regression results clearly show that there is a high degree of correspondence between the processes of modern organised manufacturing and level of literacy.

The relationships between the variables relating to the magnitude of the intra-district disparities and the corresponding levels of literacy in a district have been examined in this section. For the purpose of the present analysis, literacy has been considered as an independent and the disparity indices as dependent variables. The analysis resulted in two significant regression equations which bring out the relationship of male-female and rural-urban disparity indices with the level of total literacy. The estimated regression equations are as under:

$$X_2 = 0.74997 - 0.010\ X_1 \qquad R^2 = 0.648$$
$$X_3 = 0.64229 - 0.009\ X_1 \qquad R^2 = 0.484$$

It may be noted that the regression coefficient in these equations is negative. This indicates that the character of both male-female and rural-urban disparities are essentially similar in nature. In view of the fact that the literacy rates and the disparity indices always take positive values, the districts with high levels of literacy tend to have low disparities. Stated in other words, the analysis has shown that, with the spread of literacy, disparities tend to narrow down. This may be so in view of the fact that the new gains would mainly accrue to the lower strata as the others would have already achieved higher rates of literacy in the earlier phase.

In view of the negative value of the regression coefficient in both the equations, it is possible to find a critical value of overall literacy when the inequities in male-female and urban-rural literacy rates tend to converge to zero. This is evident from the following regression equation which shows a significant fall in male-female disparities as a consequence of a rise in rural and urban literacy.

$$X_2 = 0.65293 - 0.009\ X_{11} \qquad R^2 = 0.454$$
$$X_2 = 0.70538 - 0.006\ X_{12} \qquad R^2 = 0.207$$

It is interesting to observe that male-female disparity is reduced to zero level when rural literacy approaches 72.5 per cent, while it continues to persist even when the urban literacy reaches 100 per cent. This clearly indicates the relative importance of rural literacy in reducing the intra-regional disparities between males and females to a zero level. While interpreting these results, it is significant to note that they are based on cross-sectional data and have limited use for projection purposes. In spite of limitations, however, the equations have broadly captured the trend.

The foregoing results clearly reveal that the existence of a high order of inequities has considerably hindered the diffusion of literacy across different districts of the country. It is in this context that the concept of growth with equity has acquired greater significance in the development strategies in the developing economies. In the Indian context, the attainment of the objective of growth with equity would essentially involve a more effective strategy oriented towards the education of the women of the deprived sections of the society, especially those in the rural areas.

The vicious circle of underdevelopment

With a view to understanding the nature of inter-relationships between inequities and economic base indicators, as well as between literacy and economic base indicators, use has been made of Stepwise Regression Analysis to analyse the districtwise data. The analysis has shown that the economic base of a region is significantly related to the levels of literacy; which in its turn is associated with different segments of inequities in literacy rates. Some of the important results are presented below:

$$X_1 = 15.35 + 0.572\ X_{10} + 0.145\ X_8 \qquad R^2 = 0.53$$
$$X_2 = 0.48973 - 0.004\ X_{13} \qquad R^2 = 0.20$$
$$X_2 = 0.61788 - 0.006\ X_{10} \qquad R^2 = 0.37$$
$$X_{13} = 49.39 - 0.460\ X_8 - 0.542\ X_9 + .212\ X_{10} \qquad R^2 = 0.61$$

The regression results presented above give ample and unambiguous evidence to confirm the hypothesis that, with social modernisation and economic diversification of economic activities (non-primary activities), the levels of literacy tend to rise and, as a consequence, the inequities at the basal stratum of the multi-level educational pyramid tend to narrow down.

The regression results also reveal that urbanisation is the composite effect of the economic base characteristics of the district. The value of R^2 in this case is .61. An examination of the regression equation reveals that the processes of urbanisation are accompanied by the modernisation and the industrialisation of the economy. It may be noted that the three variables relating to the economic base of a district (i.e. X_8, X_9, X_{10}) do not add up to give the total work-force. We have not considered the percentage of workers in the household sector as a separate variable. It is thus evident that the persistence of inter-regional disparities and the attributes of fragmentation of the socio-economic structure are intrinsically intertwined. The above regression results further reveal that urbanisation, to some extent, also helps in reducing male-female disparities.

Following the gross features emerging from the inter-relationships between economic base characteristics and educational development indicators as reflected in inequities and levels of literacy rates, we now proceed a step further in our analysis and propose a model of the vicious circle of underdevelopment, incorporating the basic elements and characteristics of the regional structure of the Indian economy which continue to inhibit the development processes even after more than thirty years of planned development. The vicious circle of underdevelopment is presented in Figure 3.

A close examination of the proposed model reveals that, in view of the predominantly agricultural base of the Indian economy, a large part of the population lives in rural areas, constituting a hierarchy of the system of settlements which reflect the continuance of some distortions of the inherited fragmentation of the settlement continuum along the rural-urban interface; which in its turn is associated with the emergence of disparities between rural and urban areas. It is through these infirmities of the spatial organisation of underdevelopment that the economic space gets transformed into a highly differentiated field and, as a consequence, imbalances and inequities emerge across different regions as well as between different social groups. These mechanisms are crucial, particularly in the developing economies, as the persistence of high inequities and regional imbalances constrain and are themselves constrained by low industrialisation and low urbanisation, leading, firstly, to a weak, inadequate and distorted non-primary sector, and, secondly, to a primary sector which is characterised by low productivity and mass poverty. Thus, the reasons for educational backwardness in India are essentially rooted in the inadequacies and infirmities of its economic base, which in its turn is characterised by the persistence of the distortions embedded in the system during the colonial period and of the infirmities and limitation of the current development strategies.

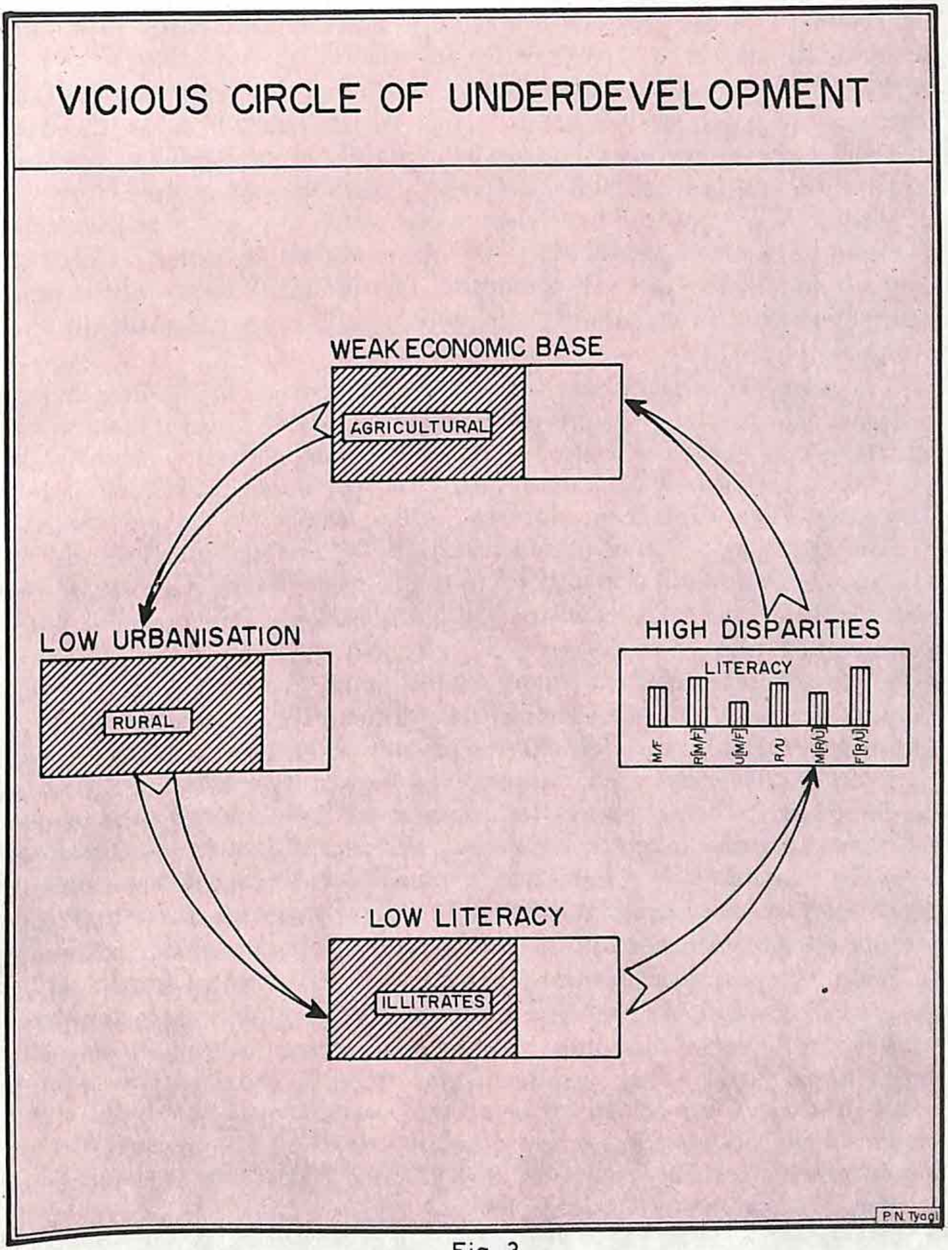

Fig. 3

With a view to unravelling the complexities in the process of diffusion of literacy, the foregoing analysis was essentially concerned with the identification, measurement and explanation of inequities in territorial distribution of literacy. The analysis was based on districtwise data on literacy for the year 1981 and an attempt was made to explain its relationship with disparities in literacy rates and economic base characteristics. From the foregoing discussion, we can draw the conclusions set out below.

The continuing low levels of literacy, particularly in rural areas, and the persistence of a high level of inequities, partly reflect the failure to achieve the goals of universal primary education and calls for a system of resource distribution of a fundamentally different kind to the present one.

With a view to pinpointing the regions which require special remedial measures to raise their levels of literacy, the study has identified the districts with varying degrees or levels of literacy. The analysis has shown that more than half of the districts in India still continue to have significantly low level of literacy.

The examination of causal relationships corroborates the finding that the economic base of a region exerts a strong impact on the spread of literacy; and that the processes of urbanisation and industrialisation strongly influence the levels as well as the inequities in the distribution of literates. A vicious circle of underdevelopment incorporating these characteristics has been presented.

The findings of the present study have serious implications for educational policy and evidently point to the need for a different strategy for educational development. The analysis has highlighted that any generalised all-India formula of incentives will not yield the desired results, as the problems of inequities are deeply rooted in the regional sub-systems of interdependencies and can, therefore, be satisfactorily analysed and remedial action for their minimisation effectively undertaken only within a regional frame. It is surprising to note that, during the last three decades of planned development, policy measures for educational development were usually based on the results of aggregate analysis and no serious attempts were made to evolve suitable policy measures or plans of action relevant for specific regions, which would call for different sets of measures for planning formal and non-formal education and the appropriate use of multi-media technology so as to achieve universalisation of elementary education. A district with a high concentration of Scheduled Castes or rural population, for example, calls for a different set of incentives, of school mapping techniques, of teacher deployment, and hostel arrangements, than a district with a high concentration of non-scheduled or urban population. It is only through a system of education which is best suited to needs and is integrated with the environment that the problems of reducing disparities in educational development can be satisfactorily tackled.

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V.G. KULKARNI

Equality of Educational Opportunities

V.G. Kulkarni

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Equality of Educational Opportunities

THE ROLE OF EDUCATION AS A PRIME MOVER IN SOCIO-CULTURAL dynamics becomes obvious when a society launches itself on the path of industrialisation. Soon after Independence, India, having decided to become an industrialised modern nation, realised the need to educate all sections of the society. Education, with a strong component of science and technology, has to be shaped to serve this purpose, namely that of converting the population into manpower. This task was not easy, since India had also decided to adopt a participative mode of decision-making (parliamentary democracy) and had declared its faith in secularism and in equality of opportunities.

The first task was to give access to education to a vast majority of illiterate population, that had never been educated in the formal sense. The term 'universalisation', therefore, meant, and quite rightly so, that a large infrastructure had to be created so that any child could walk to school. It should be recorded to the credit of our people that this task has been more or less achieved.[1] In terms of sheer numbers, it is indeed an achievement. However, education unlike (say) vaccination, is a social process. It is not enough to provide physical access. Families that have been traditionally left out of the formal stream of education do not get access to education simply because a building called 'school' is built in their locality. The whole process of education has to be felt in order to perceive its utility in enabling one to play higher, better paying, and perhaps more demanding socio-economic roles. In other words, equality of educational opportunity is not truly established by throwing the gates of the school open; equity is established only when every entrant is equipped to benefit from the school proceedings, not merely in terms of information content, but also in terms of awareness to realise one's full potential. These factors, together with severe handicaps of poverty, have prevented us from achieving universalisation of education, in spite of setting up a huge infrastructure. Obviously, serious research and development is needed to identify the socio-cultural, pedagogic and linguistic factors that

[1] These figures are readily available. See for example, the *Fourth All India Survey*, NCERT, or *Challenge of Education—a Policy Perspective,* Ministry of Education, New Delhi

prevent first-generation learners from continuing in school, and to design remedial measures to overcome these factors.

Hurdles in universalisation

The problem of universalising elementary education is truly difficult. Steps like making primary education free, reducing allied costs of education, providing all conceivable incentives, have had only marginal impact on the enormous drop-out rate in the first two years of schooling. We have done our best to provide schools; why then are children walking out of it?

As a result of the large scale expansion, pupils from all sections of the society are now seeking entry to the school. There is, therefore, considerable variation between pupils in factors like pre-school education at home, language development, and knowledge of what to expect from school. Most parents have only a vague idea of how the school proceedings are going to equip their children for a more prosperous life. The teacher, however, is not yet sensitive to this changing scene and sticks to his age-old role of trying to teach prescribed books and conducting what he believes to be a fair examination. The result is simple and predictable. In spite of several changes in the outward appearance of the individual, the product of the system has lost his face.

Is it possible to make the teacher aware of the changing needs of the students, and would such an attempt lead to significant changes in the atmosphere of a typical classroom? An opportunity to study this problem was available in the curriculum development project undertaken by the HBCSE in collaboration with the Sane Guruji Vidya Prabodhini at Khiroda, in a dozen villages around Khiroda in Jalgaon district.[2] Parameters like teachers' qualifications, poverty of schools, nature of textbooks, the examination system, etc., were all taken for granted as inoperable parameters, and efforts were concentrated on making the teachers aware of the problems faced by the first-generation learners and on instructing the teachers on remedial measures to overcome these difficulties. For example, the teachers were instructed to make a deliberate attempt to teach pupils to speak in full sentences and then to cash on every opportunity for comparing two objects, or two events or two processes so that the pupils learnt to use effectively conjunctions like, *if, then, however, even though, because*, etc. In teaching science, the teachers were trained to take the discussion out of the limits of the textbook and relate it to the daily life of rural children.

There was yet another aspect which we could not have failed to notice. The traditional learner has some understanding of 'an expected answer' and has the ability to express his answer in sophisticated bookish language. The others have genuine and worthwhile responses which do not get accepted. These pupils, besides being denied intellectual satisfaction, get wrongly labelled as 'backward' while the traditional learner, parroting a bookish answer, is labelled (again wrongly) 'bright'. The teachers were sensitised to this situation and were advised to give differential attention to the first-generation learners.

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[2] For a detailed description of the Khiroda Project see V.G. Kulkarni 'Problems of First Generation Learners'. Proceedings of the Khiroda Conference, HBCSE, 1979.

Creating awareness in teachers

It would be out of place to narrate the full story. I would like to mention, however, that an attempt was made to quantify these observations (specific tools were developed and field-tested) and a systematic and quantitative evaluation of the project was undertaken.[3,4,5] The graphs presented below show how far the experimental group had progressed in comparison with an equivalent control group in the same area. The experiment clearly shows that it is extremely important to make the teachers aware of and sensitive to the problems of first generation learners and that, with reasonable efforts, it is possible to bring about effective changes in the teaching-learning system.

The language barrier

The importance of developing language as a communication skill was clearly brought out in the Khiroda project. This aspect will be dealt with again at a later stage. However, the importance of this aspect and the total lack of sensitivity of the elite to the language barrier is illustrated in another project organised by the HBCSE.[6] A preliminary study showed that the level of the Marathi language in which the General Science textbooks for classes V, VI and VII were written was higher than that of the language textbook prescribed for the same standard. It was also found that concept formation was hindered considerably by the unnecessarily complex language. A pilot project conducted in four districts of Maharashtra also showed that simplifying the language of expression improved the scores of most students (see figure 6).

A large-scale project was undertaken with the cooperation of the Municipal Corporation of Greater Bombay and the Bureau of Textbook Production of the Government of Maharashtra. The General Science textbooks were rewritten in simplified language. It must be mentioned that the technical words, which are necessarily of Sanskrit origin, were not changed, the pictures and illustrations as well as the contents on every page

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[3] V.G. Kulkarni and J. Ramadas: 'New Tools for the Evaluation of Science Education Programmes' and 'Evaluation of the Khiroda Project', Proceedings of the Khiroda Conference, HBCSE, 1978.

[4] V.G. Kulkarni: 'Science Education for Human Resources Development', *Commerce,* Annual Number, 1978

[5] J. Ramadas: 'Evolving and Testing a Strategy for Curriculum Development in Science Relevant to the Indian School System at the Primary and Secondary Levels', Ph.D. thesis (unpublished), University of Poona, 1981.

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[6] V.G. Kulkarni, and V.G. Gambhir: 'The Effect of Language Barrier on the Universalisation of Education', *Indian Educational Review,* Vol. 16, January 1981.

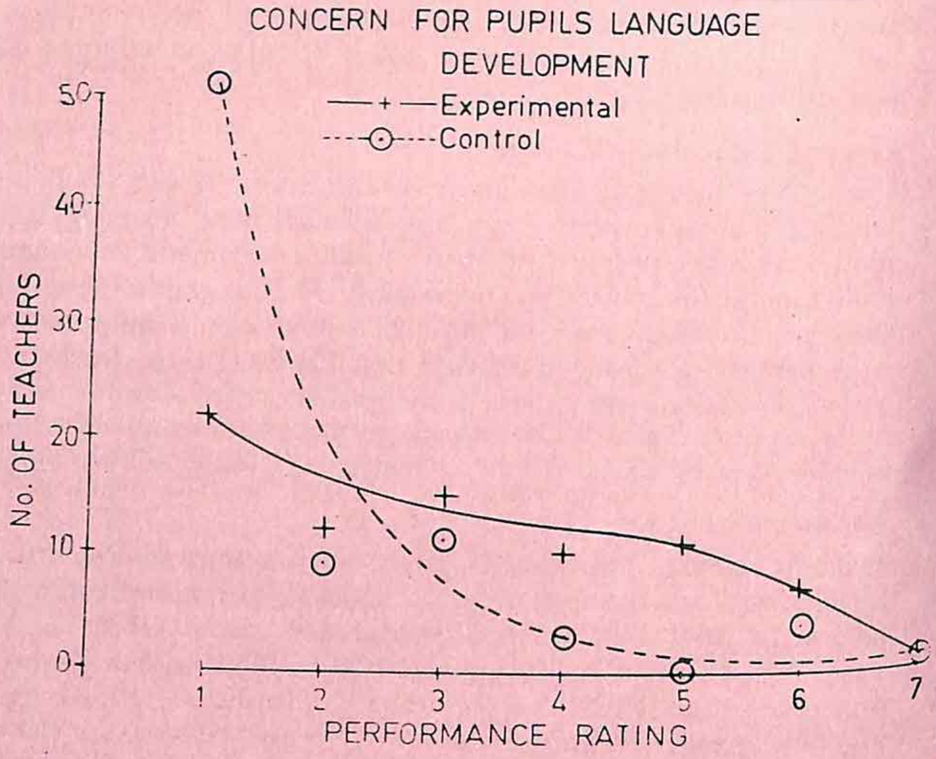
CONCERN FOR PUPILS LANGUAGE DEVELOPMENT
—+—Experimental
---⊙---Control
No. OF TEACHERS
0
10
20
30
40
50
1
2
3
4
5
6
7
PERFORMANCE RATING

FIG.1

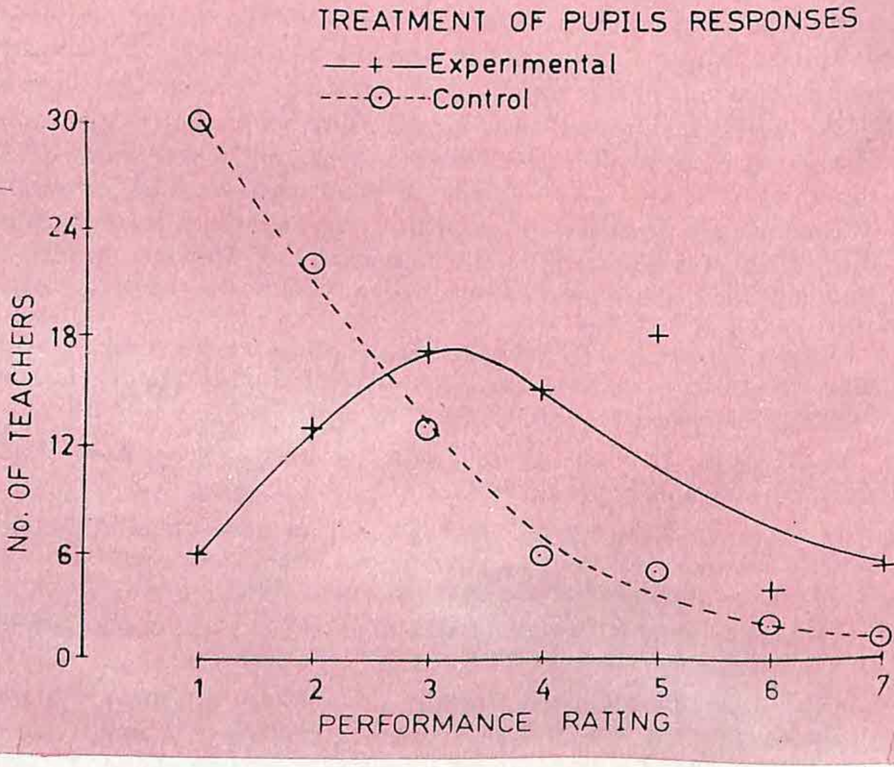
TREATMENT OF PUPILS RESPONSES
—+—Experimental
---⊙---Control
No. OF TEACHERS
0
6
12
18
24
30
1
2
3
4
5
6
7
PERFORMANCE RATING

FIG.2

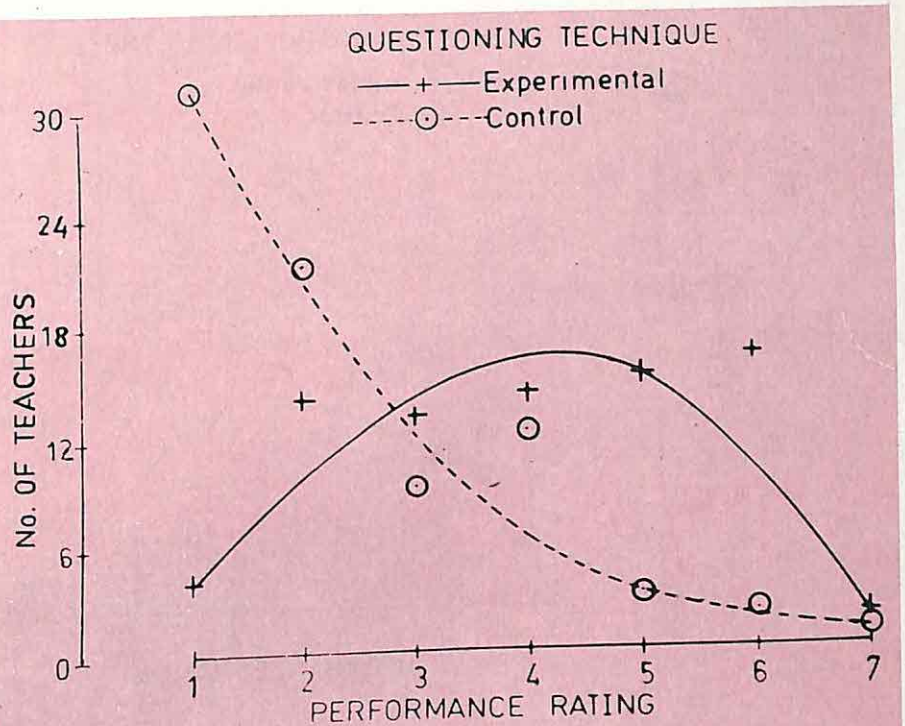
QUESTIONING TECHNIQUE
—+— Experimental
----⊙--- Control
No. OF TEACHERS
30
24
18
12
6
0
1
2
3
4
5
6
7
PERFORMANCE RATING

FIG. 3

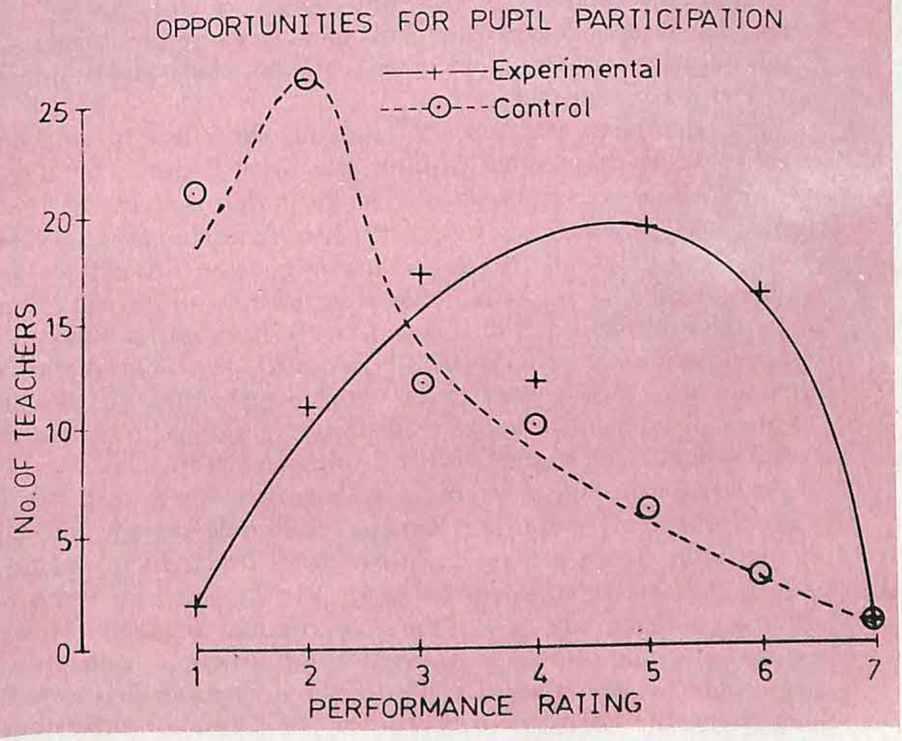
OPPORTUNITIES FOR PUPIL PARTICIPATION
—+— Experimental
---⊙--- Control
No. OF TEACHERS
25
20
15
10
5
0
1
2
3
4
5
6
7
PERFORMANCE RATING

FIG. 4

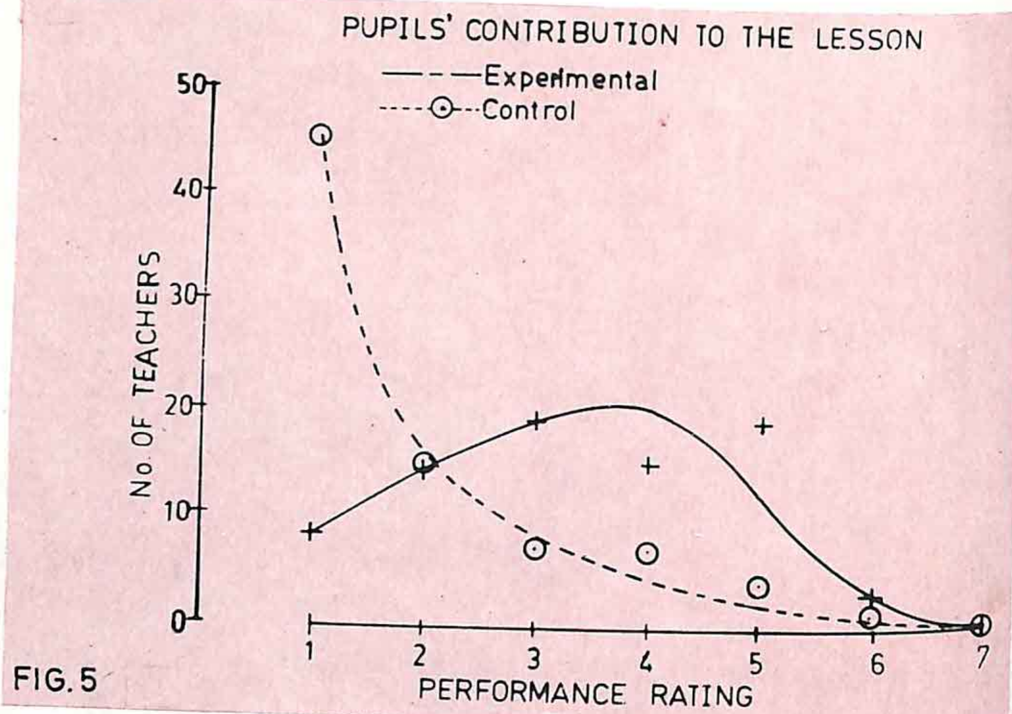

FIG. 5

were all conserved. Only the language of exposition was changed. To give an illustration in English, "The importance of this factor cannot be overestimated" was changed to "This factor is important". All unnecessary double negatives, passive voices, clumsy constructions, and lengthy sentences were rewritten in simpler form.

The experiment consisted of studying the effect of simplifying the language of the textbooks without any other input. The linguistically simplified books were prescribed in 29 middle schools of the Bombay Municipal Corporation while the other 30 middle schools in the same locality served as control schools. No teacher training was involved. It was found that the performance of students in the experimental group was significantly higher than that of the control group, in all the examinations conducted by the Corporation. On tests specifically designed to test concept formation, the difference was even greater. Even more importantly, the teachers using linguistically simplified books used simpler language in the classroom and evoked considerably higher teacher-pupil interaction.

Yet another finding deserves special mention. It is known that, of all the factors influencing pupil performance, the home background is the most important one. It is not surprising, therefore, to find that the students from the lower middle-class perform better than those coming from industrial slums (all the students are from the Corporation schools). However, the linguistically simplified versions benefit students differentially, and compensate for this variation in the home background (see figure 7). Simplifying the language of exposition, by eliminating the unnecessarily

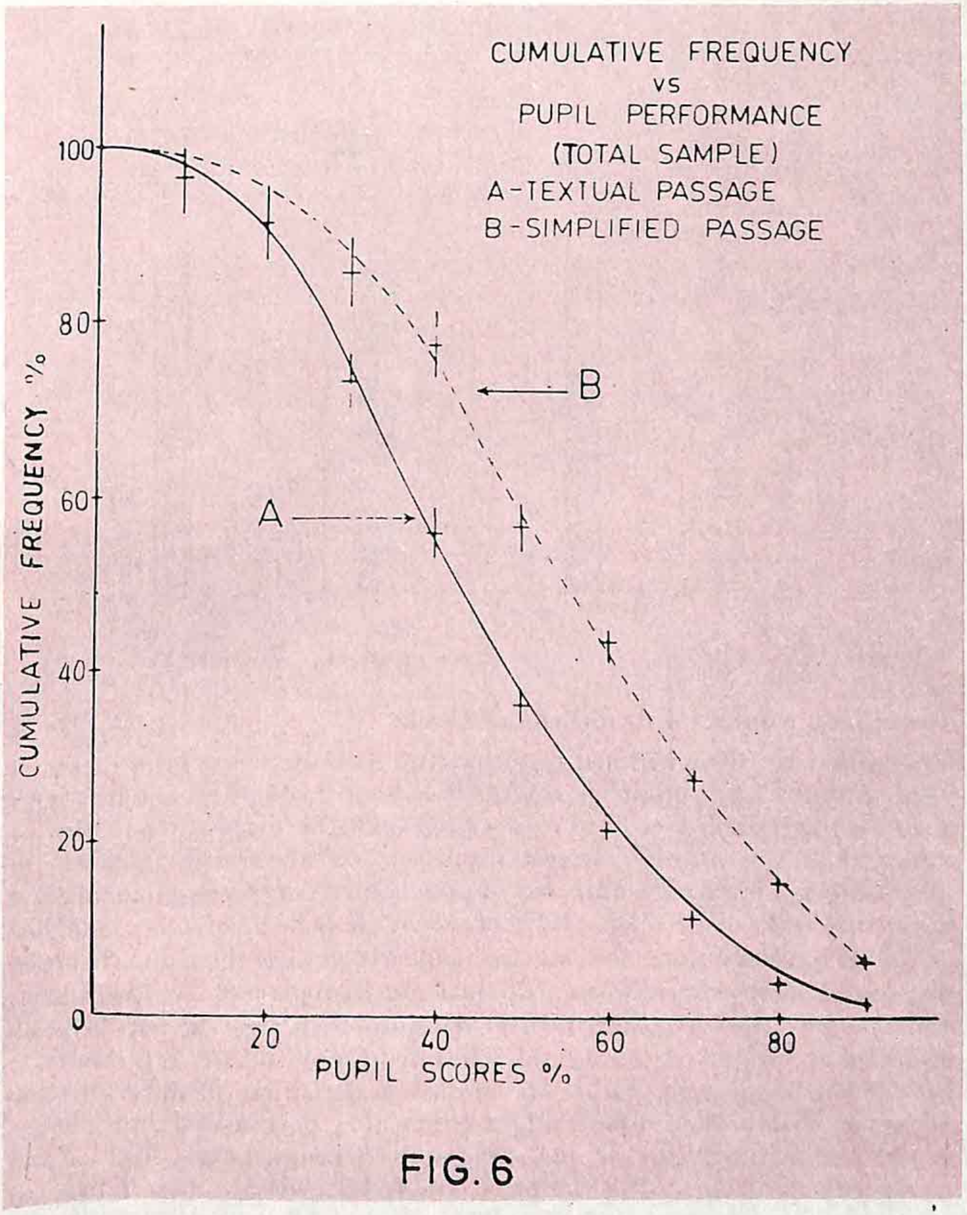

FIG. 6

clumsy or complex constructions, is a simple remedial measure that is inexpensive and effective. It does not involve teacher training. One hopes that the educational system would not be insensitive to such innovations.[7,8]

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[7] V.G. Gambhir: 'The Effect of Language Barrier on Science Education', Technical Report 5, HBCSE, 1984.

[8] V.G. Kulkarni: 'Alternatives in Education', *Man and Development,* March 1985.

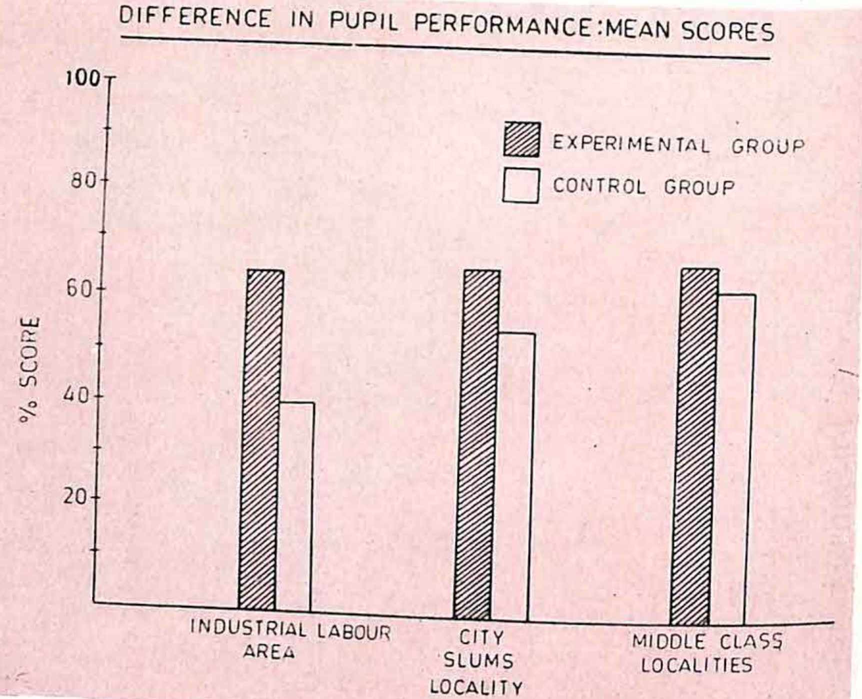


FIG.7

Remedial measures for the Scheduled Castes

The plight of the Scheduled Castes exemplifies the worst form of social deprivation. While untouchability has been abolished by law, equality is far from being established. As a first step towards ensuring equality of educational opportunity, several measures like reservation of seats in institutions of higher learning and in professional courses (engineering and medicine) have been taken. It is known that Scheduled Caste students admitted to these courses are mostly unable to complete them and that even those who manage to complete them take much longer to do so. Institutions like the IITs offer remedial courses designed to bridge the gap between expected and actual capabilities of Scheduled Caste students at the entry. It would not be an exaggeration to summarise the situation thus: all these measures have created more problems than they have solved and that the general unhappiness around, both among the Scheduled Caste students and among the non-Scheduled Caste ones (who feel deprived of their right based on merit) is increasing. Conventional surveys and tests would predictably show that the deprived perform at a lower level compared to the others. The question is: Can effective remedial measures be designed to compensate for the social deprivation?

The HBCSE has been experimenting in this field for the past five years.[9,10] It was decided to conduct this experiment at the secondary school level, from

[9] V.G. Kulkarni and S.C. Agarkar: *Talent Search and Nurture among the Underprivileged*, HBCSE, October 1985.

[10] V.G. Kulkarni: 'Who Says Science is Difficult?, *Science Age*, Oct.-Nov. 1983.

class VIII onwards. A batch of forty Scheduled Caste students studying in class VIII in the secondary schools of the Bombay Municipal Corporation was selected in 1980 on the basis of their performance in a specifically designed scholastic aptitude test. Subsequent batches were added in later years. Also from the second year an equivalent control group of forty Scheduled Caste students was also chosen for comparison. The selected students spent Saturday afternoons at the HBCSE laboratories located at the Nana Chowk Municipal Secondary School at Grant Road, where they were given remedial instruction. Assuming that about thirty weeks are available in an academic year, the total exposure of the project students to scientists of the HBCSE was limited to one hundred clock hours per year. During this time, the students had to be given remedial instruction in physics, chemistry, biology, algebra, geometry and English, which works out to nearly sixteen clock hours per subject. Obviously one cannot teach much in such a short time.

A different model was, therefore, tried. It was assumed that the students were as good as any others and that they had the potential to succeed in school. The experimentally observed fact that they were not succeeding was then attributed to some artificial block in concept formation. Attempts were made to identify such blocks so that specific remedial measures could be designed to remove them. It was also assumed that once these blocks were removed, normal progress consistent with the natural potential of the students would automatically follow.

This model worked. The set of graphs that follow tell this story. At the time of selection, the selected Scheduled Caste students were hardly distinguishable from the general population of students studying in the secondary schools of the Corporation. Three years later, the performance of the project students is obviously superior to that of the general population. This story is repeated for the next batch also. At the time of selection, the control group was equivalent to the experimental group. It can be seen from the graphs that while the experimental group has shown steady and consistent progress, the control group has slided down. It is now fairly obvious that the remedial measures worked.

It would be difficult to describe these remedial measures in adequate detail in this short report. These have been spelt out in considerable detail in the book, *Telent Search and Nurture among the Underprivileged,* published by the HBCSE.[11] However, a few salient features illustrating the nature of the remedial measures could be mentioned here.

1. *Vocabulary*

There are any number of status surveys that would show that pupils from a poorer home background have a poor vocabulary. However, English is taught as a second language to most students in India; it is seldom spoken at home. Why should some students, then, have a poor active vocabulary when all students in the class are introduced to the same words in the same order in

[11] Kulkarni and S.C. Agarkar: *Talent Search and Nurture among the Underpriviliged,* HBCSE, October 1985.

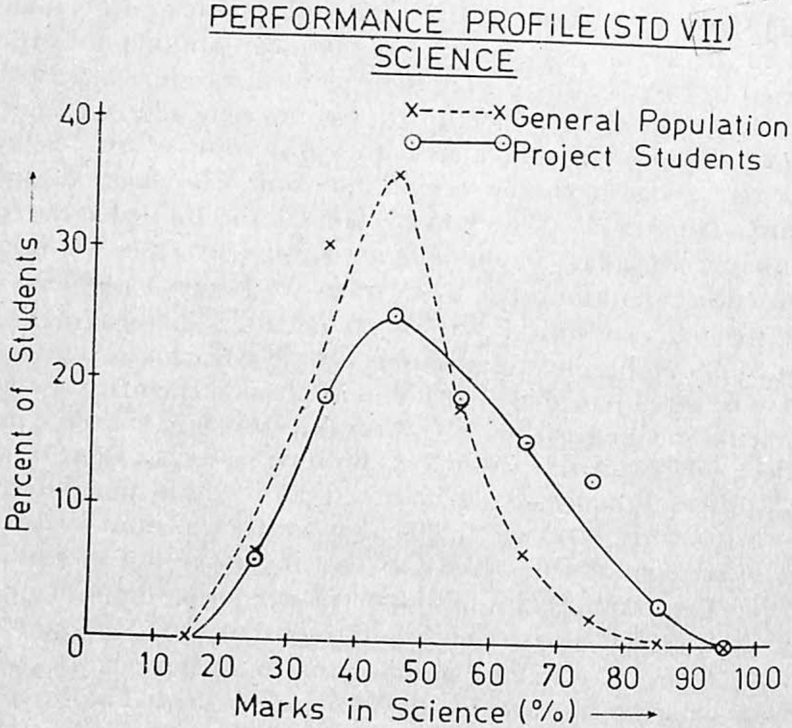

PERFORMANCE PROFILE (STD VII)
SCIENCE
×-----× General Population
⊙——⊙ Project Students
Percent of Students →
0
10
20
30
40
10 20 30 40 50 60 70 80 90 100
Marks in Science (%) →

FIG. 8

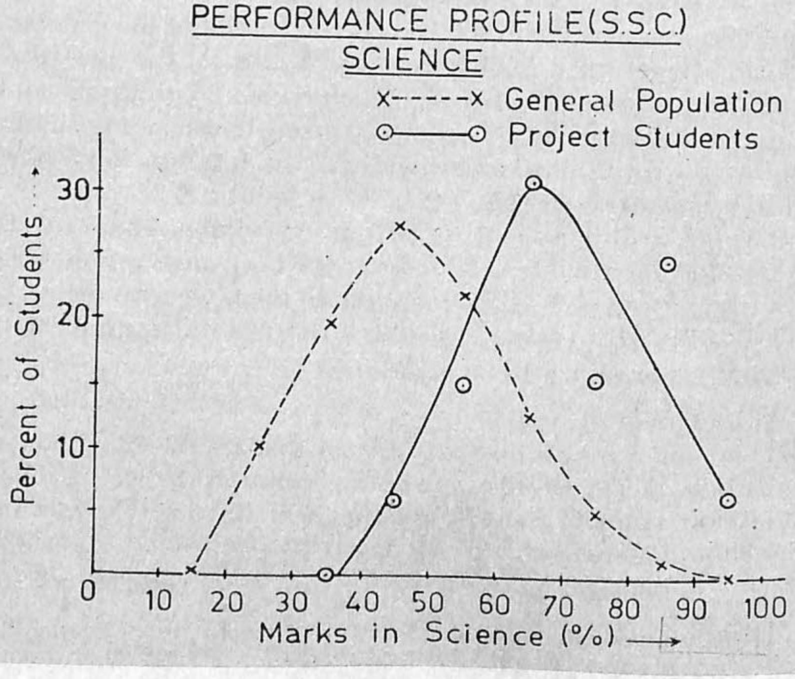
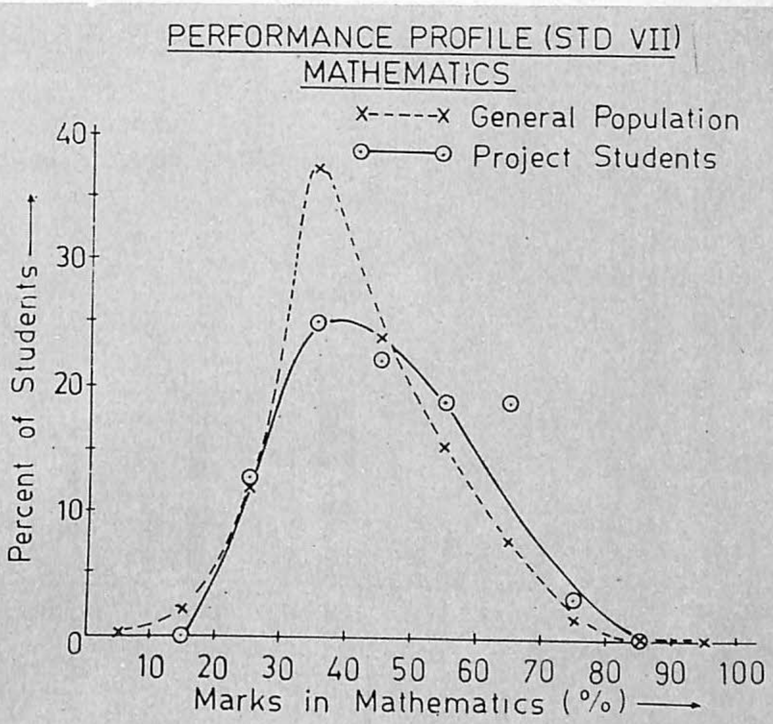
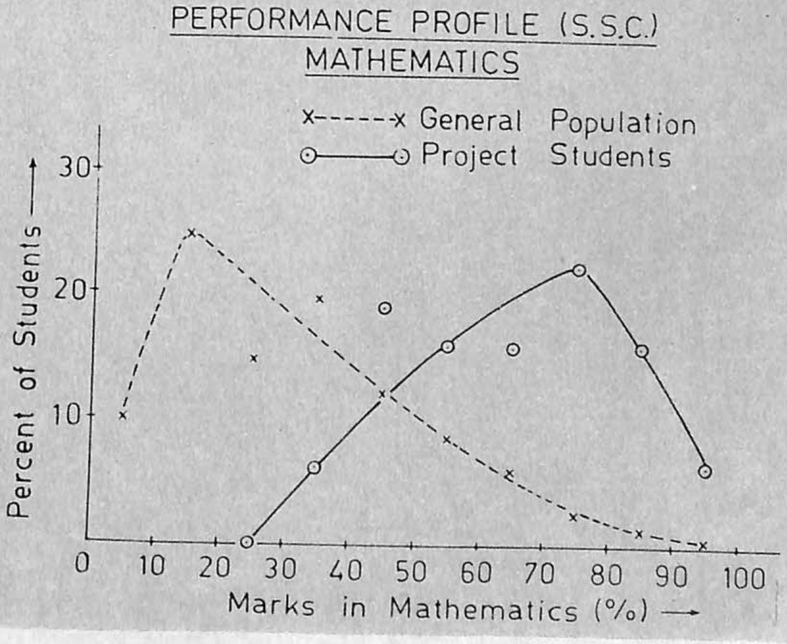

PERFORMANCE PROFILE (S.S.C.)
SCIENCE
×-----× General Population
⊙——⊙ Project Students
Percent of Students →
0
10
20
30
10 20 30 40 50 60 70 80 90 100
Marks in Science (%) →

FIG. 9



PERFORMANCE PROFILE (STD VII) MATHEMATICS

FIG.10



PERFORMANCE PROFILE (S.S.C.) MATHEMATICS

FIG.11

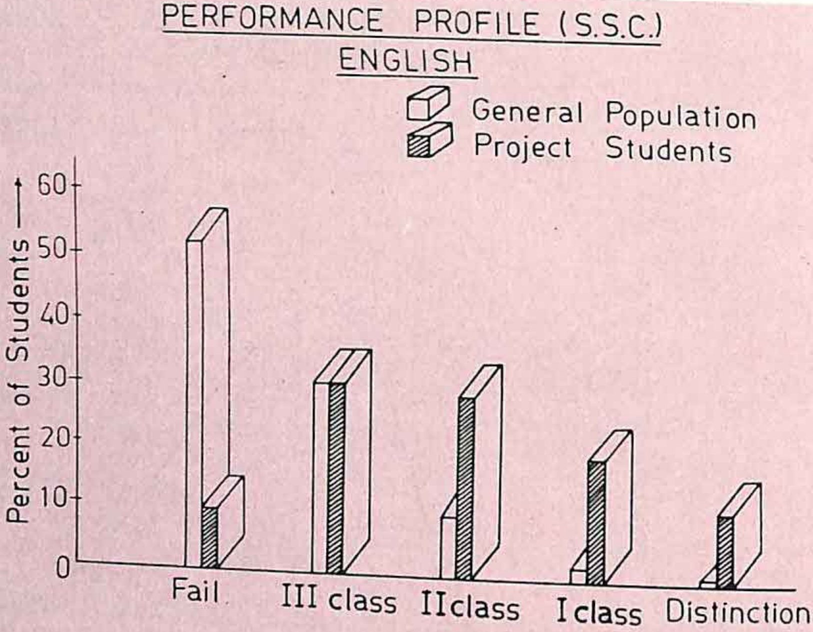

PERFORMANCE PROFILE (S.S.C.)
ENGLISH
General Population
Project Students
Percent of Students
0
10
20
30
40
50
60
Fail
III class
II class
I class
Distinction

FIG.12

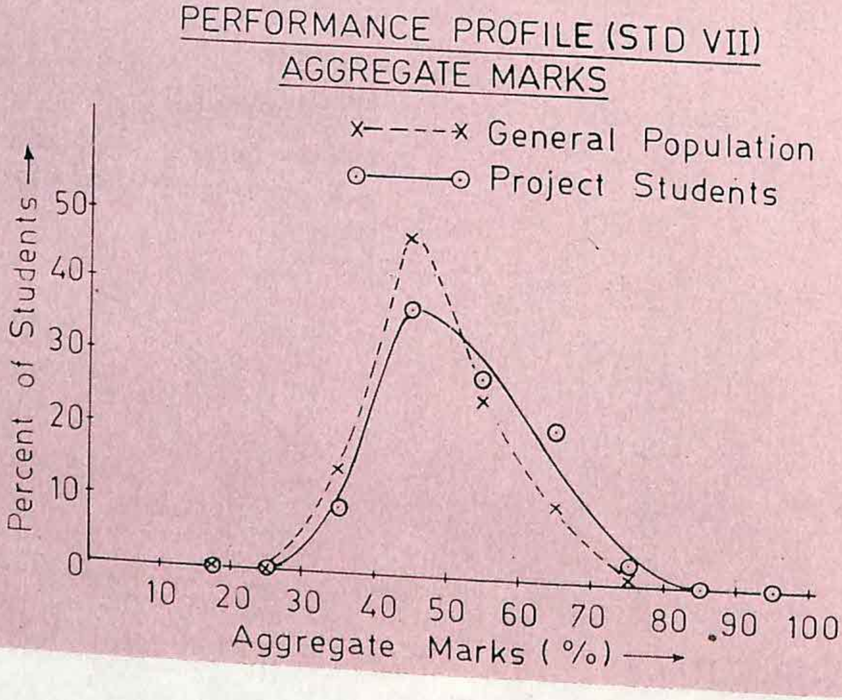

PERFORMANCE PROFILE (STD VII)
AGGREGATE MARKS
General Population
Project Students
Percent of Students
0
10
20
30
40
50
10
20
30
40
50
60
70
80
90
100
Aggregate Marks (%)

FIG.13

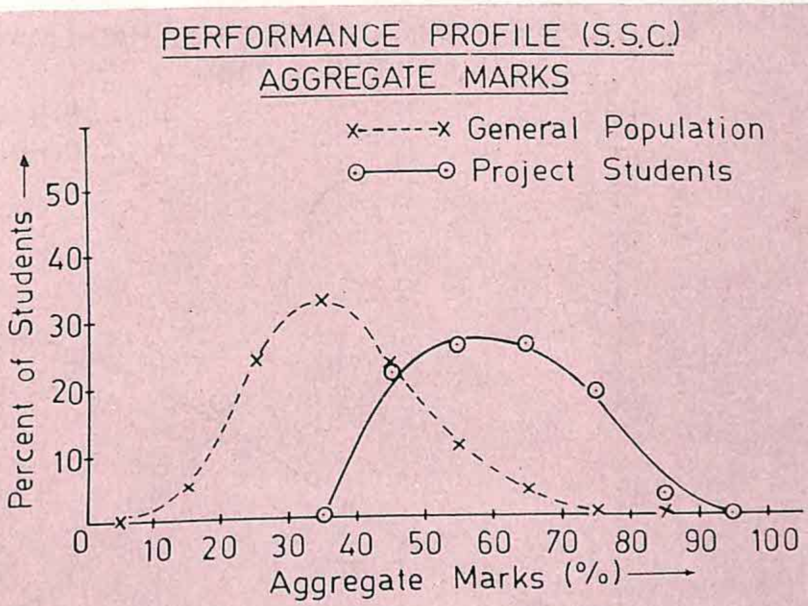


FIG.14

PERFORMANCE PROFILE FOR SCIENCE
S.S.C. 1984

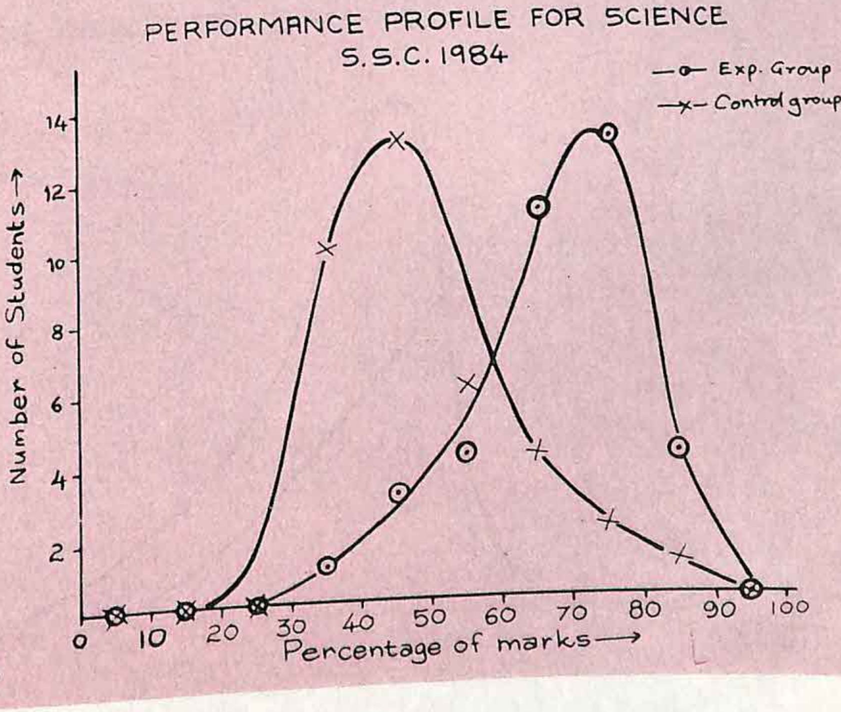
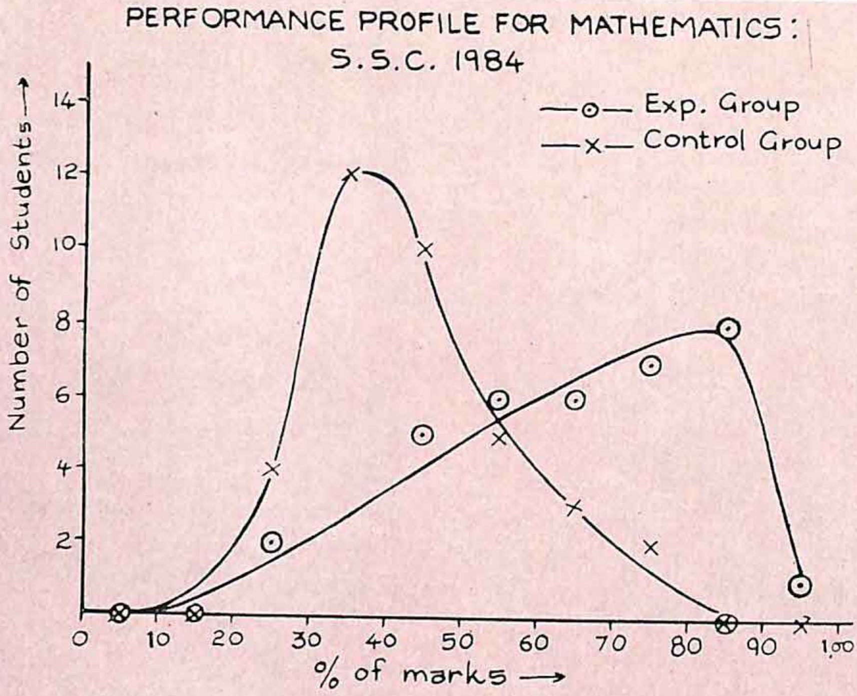
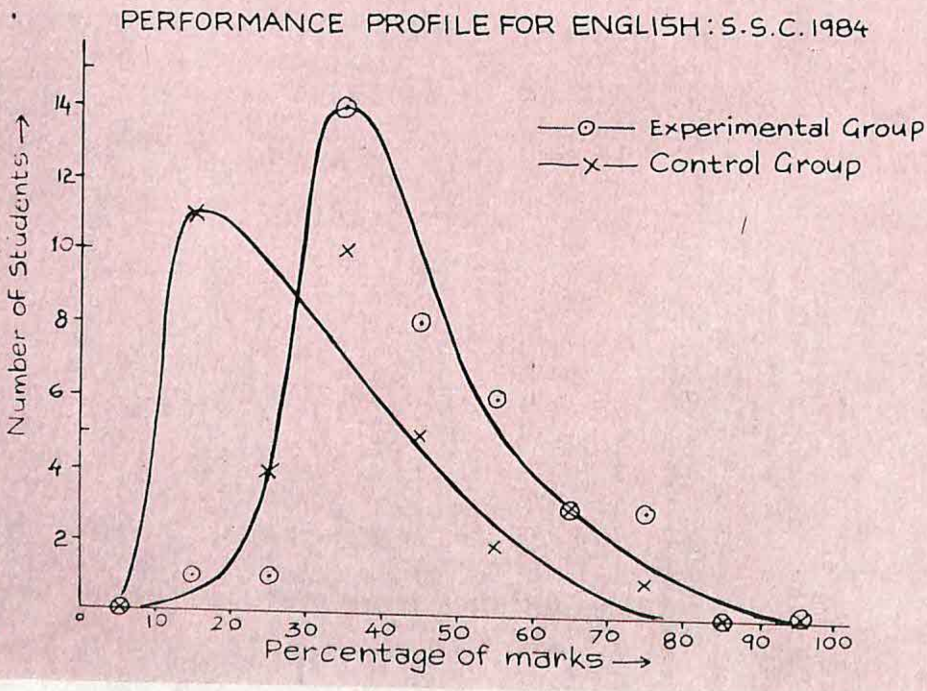


FIG.15



PERFORMANCE PROFILE FOR MATHEMATICS: S.S.C. 1984

FIG.16



PERFORMANCE PROFILE FOR ENGLISH: S.S.C. 1984

FIG.17

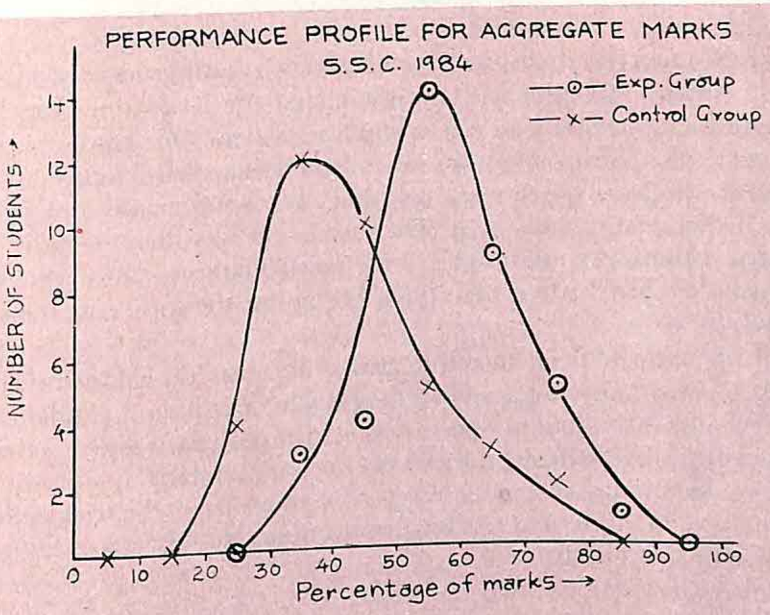
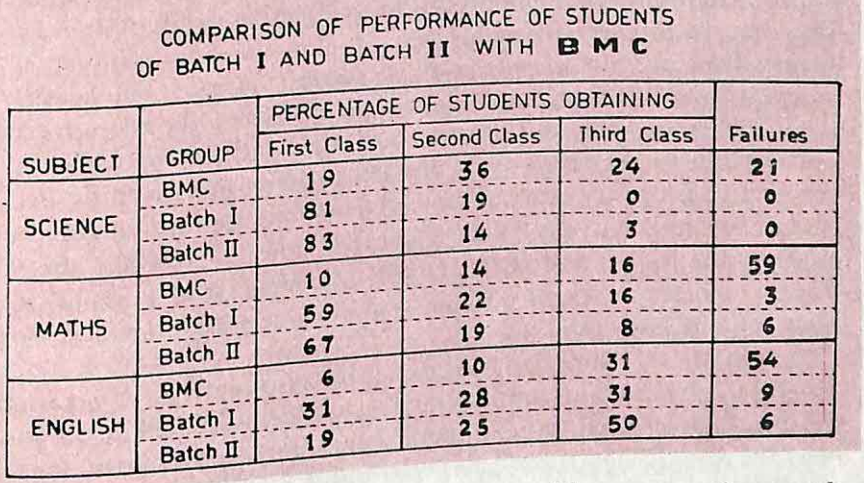


FIG.18



COMPARISON OF PERFORMANCE OF STUDENTS OF BATCH I AND BATCH II WITH BMC

SUBJECT	GROUP	PERCENTAGE OF STUDENTS OBTAINING			
		First Class	Second Class	Third Class	Failures
SCIENCE	BMC	19	36	24	21
	Batch I	81	19	0	0
	Batch II	83	14	3	0
MATHS	BMC	10	14	16	59
	Batch I	59	22	16	3
	Batch II	67	19	8	6
ENGLISH	BMC	6	10	31	54
	Batch I	31	28	31	9
	Batch II	19	25	50	6

FIG.19

school? The remedial measure consisted of games like constructing words using letters in a given word, like TABLE. Soon many words which the students had once learnt, but were now stored in the passive vocabulary, were re-activated. So fast was their progress that within six months the class was able to construct 55 different words using letters from the word STATIONERY. The marks obtained by the students in English show how effective this remedial measure was. For the sake of completeness I must also record that the obvious remedial measure of teaching words was also tried. The students were bored. Repeating the same lesson does not constitute a remedial measure.

2. *Knowing the rule of the game*

It is known that certain topics in geometry such as congruency of triangles are found difficult by students. It was felt that the basic objectives of going through such exercises were not made clear to them. One hour was, therefore, devoted to discussing conditions under which geometrical figures would look identical. Students quickly realised that two circles would look exactly the same if their radii were equal. The discussion was then extended to cover squares, rhombuses, rectangles and parallelograms. Once the idea was grasped they had little difficulty in following the topics in their normal studies.

The same difficulty is encountered in other areas like balancing a chemical equation, or simplifying a complicated algebraic equation. Students often do not know for sure what they are expected to do. Once this aspect is understood clearly, the task of learning the tricks of the trade is relatively simple to master. We have seen many instances of repeated exposure to the tricks of the trade failing to yield the desired result when the objectives of the whole exercise are not clarified explicitly.

3. *Visualisation*

Mathematics is considered by all to be a very difficult subject. The examination results also bring this out. Nearly 50 per cent of the students from the Bombay Municipal schools fail in mathematics at the SSC examination. The main difficulty in mathematics is that of 'visualisation'. This term implies an ability to perceive a pattern after it undergoes a few transformations. For example, geometrical figures like triangles, circles or squares have patterns and properties that are easily recognisable. What the students fail to perceive are the hidden patterns in a given figure. Thus, a problem in geometry often looks trivial after an appropriate construction is made. Students then ask, "That is fine. But how did you know this?" This is precisely the problem of visualisation. The same problem occurs in algebra where students are expected to perceive how an equation would look after a few simple transformations.

There are no short cuts to acquiring visualisation. It was, therefore, decided to give students ample practice on the blackboard. It was found that retaining the original figure or equation of the problem in one corner of the blackboard was very useful in overcoming the fear of losing one's tracks. Ample time was given to study the figure or the equations. Students were encouraged to discuss the strategy for the next step which was implemented on the blackboard by one of them. If a mistake was committed, they could always start all over again with the help of the diagram/equation preserved in one corner of the board. This strategy improved their ability to visualise patterns considerably. It must be mentioned, however, that this process is very slow. Using this method, one cannot solve more than a couple of problems (usually only one) in one clock hour. But then it is not necessary to solve a large number of problems. Once the method is understood, the students are able to carry on.

4. *The nature of examination*

Most students do not know how their answer-books are evaluated. They only seem to wonder why some lucky students get good marks all the time while some others, like them, never get good marks, no matter how hard they work. Here, the remedial measure consisted of conducting full-scale examinations with proper question papers and examining the answer-books in their presence. The students were shown how much they could have scored (based on how much they knew) and how many marks they lost either due to slipshod writing or because they broke certain rules. Thus, a student could see that he had scored 62—19 = 43 out of a possible 75 in a paper. No further motivation was needed to reduce the unnecessary loss of 19 marks. Moreover, the students were then able to guess more accurately the grades they would get in an examination. All this initiation and training occurs in a family of traditional learners. The remedial measures for the deprived should not be a repetition of the school experience; it is far more useful to reconstruct the home atmosphere of a family of traditional learners.

An attempt has been made to describe a few illustrative remedial measures. In all these cases the main emphasis was on identifying barriers and the remedial measures were designed to remove these. That the remedial measures so designed have worked has been amply demonstrated by the results returned by the project students at the SSC examination. In terms of finance, the experiment has been inexpensive. Theoretically, there should be no difficulty in expanding this experiment on a large scale, since, the remedial measures, once articulated, should be within the academic reach of a typical school teacher. Also, in terms of time and extra coaching needed, the measures are inexpensive. The real difficulty arises because of a general lack of faith in one of the most crucial tools of learning—reading comprehension.

Language development

Social deprivation hits very hard at linguistic development and poor language development takes care of the rest, perpetuating social stratification.[12] Hardly any study is needed to see that students coming from the weaker sections exhibit very poor language development. It is also unfortunate that the term 'language skills' is often equated to vocabulary and grammar and remedial measures are undertaken to boost vocabulary or to present rules of grammar. The real problem is qualitatively different and more deep-rooted. Any textbook on language or linguistics will point out a special feature of the way human beings learn language. We learn a few words and some elementary rules of grammar. Yet, in real life, almost all of us speak, hear or read and understand sentences which we have never uttered or heard before. There is no difficulty whatsoever in comprehending these 'new' sentences. Then why is it that most first-generation learners feel compelled to commit to memory sets of

[12] John Downing and R. Valtin (eds.): *Language Awarness and Learning to Read*, Springer-Verlag, 1984.

Norbaert Dittmar: *Sociolinguistics*, Edward Arnold, 1976.

sentences for fear that they may not be able to express that content in their own language?

Part of this tragedy is due to our unreasonable demand that answers must be phrased in some standard manner. However, even if this tyranny is ended or diluted, the fact remains that the power of expression of an individual is a reasonably good indicator of social class. One of the important findings of this experiment is that remedial measures to improve linguistic capability must precede all other attempts to teach science and mathematics.

The school imparts literacy, which is an ability to encode and decode sounds into symbols. Elements of grammar enable one to arrange words properly, to construct a sentence. The school also places before students certain specimens of what the society considers to be good literature. This list more or less summarises the total input available to everyone. Both the traditional learner and the first-generation learner (if he survives school) are entitled to get all this. The traditional learner, however, gets many more vitally important inputs elsewhere. Consistent and ample exposure to educated adults, plenty of opportunities to read and, even more importantly, opportunities to construct arguments and match them against those of his peers or seniors, soon elevate him/her from an oral mode of language behaviour (not to be confused with illiteracy) to the literate mode of language behaviour.[13] An opportunity (and in fact the need) to write increases his competence even further. Soon, the traditional learner is able to interact with people and books to acquire information and knowledge. Practice makes his tool sharper and increases his ability to acquire more knowledge.

The first-generation learner, on the other hand, is constrained to depend entirely on a few school textbooks and on the limited adult interaction which the school provides since the intellectual component of the adult interaction at home is low. An attempt was made to provide the students with a variety of reading material (not necessarily serious non-fiction). An open-shelf library was set up for them and they were encouraged to borrow and read books of their choice. As a second step they were persuaded to discuss (orally) the contents of the books with one of the scientists from the HBCSE. An attempt was made to find out what they liked and what was missed or simply not understood. Later, the students were encouraged to write a summary of the book they read. Most students were reluctant in the beginning to write a summary. However, some tried their hand at it and encouraged by the HBCSE scientists others also developed this habit.

One of the most important hindrances to effective reading is the inability to abstract the most important component of the total information presented by the book. For example, students reading a page of printed material on 'Bhangra Dance' were unable to decide that the information bits like "it is accompanied by music" etc., were not so important as the information that it was a folk dance from Punjab. The readers who felt the need to remember all the pieces of information naturally felt 'loaded'. That acquiring knowledge can enlighten and liberate without loading is a new experience which does not come automatically. It has to be given deliberately. An attempt to give this experience was undertaken in a systematic fashion. Several pieces from literature were selected and presented to them in an attempt to build reading comprehension.

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[13] S. Scribner and M. Cole: 'Cognitive Consequences of Formal and Informal Education, *Science*, Vol. 182, 1973.

M. Cole and S. Scribner: *Culture and Thought*, John Wiley & Sons, 1974.

Several aspects of reading comprehension are taken for granted. For example, in one's adult life, one receives a large number of written messages through advertisements, newspapers and other media. These media use, besides the normal language, certain symbols, symbolism, graphs and charts. I am not referring here to scientific or technical literature. A commercial house may use charts to convey that they can make enormous profits for me. Similarly, instruction mannuals use arrows, circles and other symbolism. One tends to take it for granted that such symbolic or pictorial language is understood clearly. In fact, it is assumed that introduction of such illustrations simplifies the message and helps comprehension.[14] It was found in this project as well as in the non-formal science-based education project that pictorial literacy cannot be taken for granted and that it has to be introduced as seriously and systematically as the normal literacy.

The attempts at improving reading comprehension turned out to be very rewarding. The students read more and gained more. Even more importantly, they shared the books and perhaps this newly acquired skill with other members of their family. How far such interactions were responsible for creating awareness in the community is also an important dimension worth studying. This work is in progress.

Other tools of learning

Listening to the teacher in the classroom, reading books, solving examples from a textbook of mathematics, are the standard ways or tools for learning introduced in formal schools. There are, however, many more ways in which we learn. It is indeed a pity that students are not introduced to these ways of learning. For example, collecting and classifying samples, conducting surveys, interviewing people are some tools to which students could be introduced.[15] The Scheduled Caste students in this project were encouraged to take up some of these activities during their vacation. The students were expected to plan the activity, execute it and also write a brief report on it. The topics for survey were not provided by the HBCSE scientists; the students were expected to choose their own topic. Several surveys such as, variation in the prices of commodities during the Diwali festival, availability of public conveniences in their localities, the distribution of different types of newspapers in slum areas etc. were undertaken. Many students collected samples, some conducted interviews. Some students wrote skits, essays and poetry. These activities were planned deliberately. Firstly, it was hoped that their interaction with the community would improve as a result of these activities. Secondly, the task of planning, executing and reporting would lead to a sharpening of the basic tools of learning, besides increasing their self-confidence. Lastly, we wanted to demonstrate to them that such activities were not the prerogative of the elite, that they could also undertake these activities and learn in the process.

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[14] Michael L. Geis: *The Language of Television Advertising*, Academic Press, 1982.

[15] The same experience has been reported by Dr. Anil Sadgopal.

A. Sadgopal: Between Question and Clarity, *Science Today*, October 1981.

A Marathi translation of this article by V.G. Kulkarni appeared in *Nava Bharat*, May 1982.

The sum total of these remedial measures has yielded encouraging results. Apart from the scholastic results, home visits have indicated an increased awareness on the part of parents. In a few instances, parents changed their initial decision to terminate the education of their wards after the SSC and have encouraged them to go for higher education.

What does this experiment really show? I think it shows that, basically, all our people are educatable. If some communities are unable to progress because of socio-cultural handicaps, we must undertake the necessary research and development and design our own remedial measures. Even more importantly, it shows that large differences brought out in status surveys need not be considered unsurmountable. It is, at least in some cases, possible to bridge these gaps by taking relatively simple and inexpensive remedial measures.

SHIB K. MITRA

Quality and Content in Education

Shib K. Mitra

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Quality and Content in Education

THE QUESTION OF QUALITY OF EDUCATION HAS BEEN RAISED FROM TIME to time by educationists, planners, administrators, employers and parents. Very often, they have expressed their concern about the quality of education not being as good as it should be. Discussions on the point, however, have not shed much light on what constitutes quality in the field of education.

Quality, standards and efficiency

The dictionary meaning of the term 'quality' is 'degree of excellence'. While, in the abstract, this sense of the term may be good enough, it becomes nebulous in meaning when we consider quality of education. There is no universally accepted view of what is excellence in education, and there is no agreement on the degree of excellence either. As in the case of the good life, there is no agreement on what is good education. Because quality of education is so hard to define, it has eluded reliable and valid measurement. Hence, disputes about quality of education persist.

Very often, the terms 'quality', 'standards' and 'efficiency' are used indiscriminately, as if they mean the same thing. Most often, in discussions on quality, the concern is about falling standards of education. But standard of attainment of the pupils is only one aspect of quality, although those who are concerned with utilising the products of the education system are affected directly by this aspect of quality.

Standards of attainment, at any point in time, are known to vary from one state to another, from one district within a state to another district within the same state, and one can go down further like this until one finds that there is variation between individual schools. Such variation is natural because standards of attainment depend on a large number of factors which are not uniformly distributed throughout the country; nor does each factor contribute to the same extent to the attainment of pupils from one place to another. If this is the picture of standard of attainment of pupils, at any one point of time, it is obvious that there will be variation in standards over a period of time. Thus, standards of attainment are relative to the conditions which prevailed before and during a stage of education at the end of which standards are assessed. If one adds to this the fact that all measures of attainment of pupils are fallible and that there is no absolute scale of measurement of attainment, one can understand the difficulties inherent in any comparison of standards over a period of time. So, when we say that standards are falling, we are really expressing our dissatisfaction with the product of the education system, and nothing more. The concern is with the input-output relationship in the educational system, which is a matter of efficiency. In view of the high failure rate in public examinations, and wastage and stagnation in primary and middle schools, the efficiency of the educational system is considered to be low. But in our dissatisfaction with the products of the system we usually mix up both standards and efficiency. Performance in examinations reflects what has been learnt, how much has been learnt and how well it has been learnt. The heavy failure rate reflects deficiencies in these matters, whereas standards of attainment are, in addition, reflected in the more positive aspects of learning. As both standards and efficiency depend, more or less, on the inputs and the through-puts of the system, they are, very often, mixed up in our minds and also with the concept of quality of education.

Quality and aims of education

Like the concept of the good life, the concept of quality of education is relative. Thus, what was considered good education in the pre-Independence period, was not considered good enough during the post-Independence period. This is because there is a relationship between quality and aims of education. So long as the aim of education was to produce, in relatively small numbers, citizens with a thorough grounding in the knowledge, attitudes and values of western liberalism, for manning the services of an empire, that education which developed such knowledge, attitudes and values was considered to be good education. But with Independence, the aims of education had to change in the direction necessary to serve the changed socio-politico-economic goals of the country. The very education which was 'good' earlier, was no longer so.

The country needed to advance rapidly in the direction of democracy, secularism and socialism. It needed a large number of highly trained scientists, technologists, doctors, teachers, managers and also persons who would run the administration of a developing country, where change instead of the status quo would be the rule rather than the exception. The Constitution directed the State to provide elementary education up to the age of 14 years for all. Thus, 'good education' became that system which would provide this. There was not only a consequential rapid expansion of educational opportunities at all levels, but also the growth of a large variety of educational institutions offering courses of various kinds at different levels. There has been a movement away from the pre-Independence concept of good education. This was originally inspired by Mahatma Gandhi through his philosophy of Basic Education, with its emphasis on the dignity of manual labour, productive work and values of simplicity, austerity, etc. The shift was from an elitist to a mass education system, from English literature, philosophy and history, to Indian literature, philosophy and history: from liberal arts to science and technology; and so on.

The Education Commission (1964-66) discussed the aims of education and emphasised the instrumentality of education for social change and its linkage through productivity with national development.[1] In their report, the Commission recommended a plan of educational transformation which would take the educational system in the direction of the aims of education as they flow from the wider goals of the socio-economic development of the country.

Many educational thinkers elsewhere have pointed to two other aspects of the quality of education, viz., its significance and relevance. Thus, Paulo Freire[2] has criticised the existing system of education on the ground that it is based on the 'banking' concept of education, where knowledge is fragmented into boxes and sub-boxes, and information is stored in the memory of the individuals like deposits in a bank, to be withdrawn on demand, during examinations. He has criticised the quality of education on the ground that its aim is to preserve the relationship between the oppressor and the oppressed, exemplified in the traditional teacher-student relationship in the teaching-learning situation. Ivan Illich[3] has argued in favour of 'deschooling' society because school has become dysfunctional in the context of social change. In other words, that type of education is of good quality which leads to those social goals which are considered desirable.

In our country, the goals of education are derived from the Constitution. But these goals have been translated into educational aims and objectives, considering the country's present and future needs, as visualised in 1964-66 by the Education Commission. The quality of our education must be measured by the extent to which it reflects these aims and objectives. To the extent that it does this, our education has significance and relevance, and, therefore, to that extent, quality.

Policy Resolution of the Government of India, 1968

The Government of India accepted the main recommendations of the Education Commission and passed a resolution in 1968 stating that the Government of India is convinced of the need for a radical reconstruction of education on the lines it had recommended. The resolution stated, among other things, that "a sustained and intensive effort to raise the quality of education at all stages" will be made; that, "of all the factors which determine the quality of education the teacher is undoubtedly the most important"; and again, that "teacher education, particularly in-service education should receive due emphasis". Thus, the teacher and teacher education were regarded as highly critical for the implementation of the recommendations of the

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[1] *Report of the Education Commission 1964-66,* NCERT, New Delhi, 1971.

[2] Paulo Freire, *Pedagogy of the Oppressed,* Penguin Books, 1972.

[3] Ivan Illich, *Deschooling Society,* Penguin Books, 1973.

Education Commission. It is a pity that they did not receive as much attention as educational content did. Regarding content, the Resolution laid down that "science and mathematics should be an integral part of general education till the end of school stage".

Education Commission (1964-66) on quality and content

The Commission's report does not discuss at any length the question of quality of education as such. It does, however, give detailed consideration to various factors which should contribute to quality, such as curriculum, textbooks, evaluation, teachers and their education, and educational administration and finance. It does not discuss standards, and in the second chapter, while considering standards at the end of the first stage of school education, at the end of class ten, it states that the school will "achieve in a period of ten years what is now being done in eleven". It emphasises the fact that our standards have to be ever rising so as to compare favourably with international norms. The structural change recommended by the report arises from this approach: standards will have to go up to meet the challenges of the end of the 20th century, and the demands of our economic development; more must be learnt in less time. One cannot avoid this since rapid developments in science and technology and their application in industry, agriculture, health, communication, transport, and in everyday life, make it incumbent upon the educational system to provide adequate opportunities for children to acquire this knowledge. As J.P. Naik[4] said, "a major thrust of our efforts to improve the quality in the past five decades has been to upgrade the information content of our syllabi at all levels and in all subjects". He was aware of the criticism of the existing system that it was dominated by a banking concept of education, with its emphasis "on information gathering, memorising and reproducing in the public examination", and therefore argued that, apart from knowledge, high priority should be given in schools to the development of skills and inculcation of values. But, as Naik pointed out,

> this does not mean that we have to reduce the information content of our education system. On the contrary, we do expect even an increase in the information content, because knowledge is being doubled in a period of ten years or so and an intensive cultivation of knowledge has become a 'must' for every nation in this highly competitive modern world. There is, therefore, no escape from the necessity for all our people to learn more and more and to reach ever-increasing standards of attainment in the years ahead.[5]

Of course, Naik was aware that this goal could not be reached through schools alone and he therefore recommended non-formal education. He was also aware that teaching and learning methods would have to change considerably in order to make acquisition of a greater stock of knowledge possible. It would require better textbooks and other instructional materials, including teaching aids. It would also require a change in the existing type of examination, which emphasises only memorising.

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[4] J.P. Naik, *Equality, Quality and Quantity*, Allied Publishers, New Delhi, 1975, P. 52.

[5] Ibid., p. 63.

But the point remains that there is a relationship between standards and content. Hence the Education Commission in its report, after emphasising that we must do in ten years of schooling what was previously done in eleven, gave an outline of the content of the recommended curriculum (see paragraph 8.18 of the report).

The Commission recommended that science be introduced from class I as environmental studies, but in classes V-VII, the children should study physics, chemistry, biology, geology and astronomy. It recommended a disciplinary approach (para 8.54). In classes IX and X, it recommended physics, chemistry, biology and earth sciences as compulsory subjects.

The Commission recommended nine subjects in classes V-VII, including two languages. For classes VIII-X, it recommended three languages, mathematics, history, geography, civics, and the four sciences just mentioned.

Art, work experience, and physical and moral education were recommended as compulsory subjects for classes V-XII.

Ten-Year School Curriculum of NCERT (1975)

The NCERT started implementing the recommendation regarding school education made in the Government of India's Resolution of 1968 and expert committees were set up from 1972 onwards to develop the ideas of the Education Commission in the matter of curriculum to the stage of operational details. As a result of discussion and debate at the state and national levels of various groups of experts, teachers, administrators and the like, the NCERT adopted the ten-year school curriculum and recommended it to the states for adoption. Starting from the aims of education, the NCERT developed specific objectives of instruction at the primary, middle, secondary and higher secondary stages of school education. The subjects of study at various stages and methods of evaluation and supervision were all mentioned specifically to attain these objectives. Thus, in the NCERT document also, content is considered to be only one of the inputs needed to achieve quality. The subjects to be read in school followed more or less the pattern recommended by the Education Commission.

The relationship between quality and content of education does not lie only in the matter of the subjects read and courses offered; it lies also in what goes into the textbooks and how subjects are taught by the teacher and learnt by the learner. The NCERT started work on the preparation of new textbooks which would meet the requirements of standards as well as the objectives as laid down in its curriculum document. A three-year cycle of publication was adopted so that, in a phased programme, the new textbooks would come out between 1977 to 1979, covering all classes from I to XII in three languages, English, Hindi and Urdu. The Central Board of Secondary Education had adopted the detailed syllabi, as developed initially by the NCERT, with suitable modifications wherever necessary. Content was thus more precisely outlined for the new textbooks.

With the Patel Committee's report in 1978, the content was cut down in many areas and socially useful productive work was emphasised, instead. However, concern is still expressed over what is called 'load' in the curriculum.

As has been mentioned earlier, standards have to rise and, therefore, the need for acquisition of more knowledge in less time is inescapable. But this does not mean information-packing, although some amount of information has to be gathered and stored in the memory. The change required in processes of teaching and learning has not yet taken place. The efforts made by the NCERT, through the National Council of Teacher Education (NCTE), have not yet made a sizeable impact because the number of teachers is very large and the system of teacher training is under the control of state governments at the elementary stage, whereas it is under the universities at the secondary stage. Besides, the NCTE is not a statutory body with authority over teacher training institutions. Because of a continuation of the traditional teaching methods, the burden of learning greater amount of knowledge passes on to the student and his/her parents.

The children who are in classes I and II today will be young persons of 21/22 years in age, when the country enters the 21st century. From the trends of development in science and technology it seems that there will be far-reaching changes in the mode and manner of work in industry, transport, communication, mass media, health, agriculture, etc. From the assembly line system of specialisation, where a worker needed to be an efficient nut-turner and nothing more, we seem to be moving in the direction of working with an understanding of principles, rather than learning specific skills. Changes are rather rapid in the field of electronics and space technology, to mention only two. The point is that a time has come to have a fresh look at quality in terms of significance, relevance, capacity, standards and efficiency. The content of education and its processes of teaching, learning, evaluation and management may have to undergo major changes in order to prepare the very young children of today for the 21st century.

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S.V.C. AIYA

School Science Curriculum Dynamics

S.V.C. Aiya

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School Science Curriculum Dynamics

DURING THE PRESENT CENTURY, OLD CONCEPTS LIKE 'EDUCATION FOR its own sake', 'education for those who can afford it', 'university is a place for race horses', 'leave it to the teacher to shape the mind and mould the character of the student', etc., are fast disappearing yielding place to new ones like 'purposeful education', 'relevance in education', 'education to meet the challenges of tomorrow', etc. The latter, probably better formalised through experience, are expected to dominate the scene after 2000 A.D. Those trained in the old way are being made to bring about a change without a clear cut visualisation of what is aimed at being attempted. Consequently, there are upsets and considerable dissatisfaction among teachers, students, parents and those who run governments.The reasons for this state of affairs are now clear. Governments of countries are committed to rapid socio-economic progress which requires, among other items, trained man power, human resources. Education has to be modelled to meet this basic requirement. Hence, governments formulate educational policy and enforce it. They offer to subsidise education even to the extent of 100 per cent. Often, policies were formulated on the basis of current needs. But, the education of today is for meeting the socio-economic needs of tomorrow. It is now possible to get a picture of these through socio-economic and technological forecasting. Such a forecasting can never be perfect and will vary from country to country. However, generally, such forecasting indicates an almost continuously varying socio-economic and technological scenario with some alternatives as being not improbable. This suggests the replacement of the past and,to a large extent, the current 'educational static' by 'educational dynamics'. This paper is concerned with a segment of this problem.

Education

Education, according to current ideas which will persist beyond 2000 A.D., is a lifelong occupation. It can be full-time or part-time.It can be concerned with developing the mind and body, acquiring special skills needing the use of the mind also, developing proper values and attitudes, moulding character and behaviour with a stress on discipline and sense of duty, acquiring information and learning how to apply it, etc. Education from childhood to adolescence is called school education. Education beyond that stage is variously described as higher learning, university education, etc.

Minimum damage is done to the eye of a child through reading and writing when it has crossed the age of five. In tropical countries, adolescence commences around twelve years and the adolescent stage is over by the age of seventeen. Hence, school education extends from 5 to 17 a period of twelve years. This is because maturity occurs earlier in tropical countries.In temperate regions, adolescence is presumed to commence around the age of fourteen but the current view is that, even in such regions, adolescence commences earlier than this. Scientifically, this period of twelve years of school education can be divided into two, viz., a period of seven years upto the age of adolescence, called the primary or elementary stage, and a period of five years of adolescence, called the secondary stage. Administrative terms like primary, upper primary, middle school, secondary, higher secondary, etc., will not be used here. At the primary stage, development of the mind and body, learning through observation and experience and, generally, the 'discovery' outlook take precedence over acquiring information and applying it but, at the secondary stage, the reverse is the case.

From the standpoint of developing the mind, with which this paper is concerned, school education has a well-defined set of objectives, courses of study to realise these objectives, methods of imparting instruction, including the use of aids, and procedures for testing whether the objectives have been realised, often called achievement testing. All these taken together is 'curriculum'. For developing the mind, three equally important areas of knowledge are utilised, viz., the humanities, social sciences, and natural sciences, briefly described as 'science'. Science includes its applications, viz., technology and engineering. Even how thumb rules come about in engineering as a result of experience gets included to illustrate the limitations of man's scientific knowledge. Humanities and social sciences are very necessary for science itself and cannot be sacrificed to build better and greater knowledge of science and its applications. Hence, only about a third of the school time is available to deal with science and its applications.

Brief history

After the 1917 revolution, the USSR reorganised her educational system for purposeful education for building a prosperous economy. Many innovations were tried. Today, the achievements of the USSR show that success has been achieved. In 1957, she successfully launched the world's first space-ship, the Sputnik. Immediately thereafter, the President of the USA, Eisenhover launched his programme of science talent encouragement, doing everything for science education. Several other countries did likewise. India did not lag behind. Since 1947, Jawaharlal Nehru had been exhorting Indian scientists to harness science to the task of removal of poverty and want. After the Sputnik and the USA's special science drive, the Ministry of Education redoubled its own efforts even in the area of school education. In 1961, it set up the National Council of Educational Research and Training (NCERT).Although it does its work in English and Hindi only and, education being a State subject, schools often use the regional language, it has been able to influence the systems significantly, particularly in the field of science. It utilised the advice and assistance of the USA, USSR, UK, GDR, Unesco, UNICEF, UNDP etc., and carved out its own science programmes in terms of textbook writing, preparing school science kits, training and retraining of teachers, holding school science exhibitions, picking up talented science students, picking up talented teachers, bringing in computers to school education, introducing and evaluating new techniques of examinations and assessments, introducing extension services at selected schools, injecting technology into teacher training courses, etc. This vast and valuable experience has geared the NCERT to take up new challenging tasks.

Yet, with all this effort spread over the last three decades in several countries, the need for a fresh look has been keenly felt. The International Council of Scientific Unions (ICSU) thought in terms of a 1985 conference on 'Science and Technology Education and Future Human Needs'. Although school science was only a part of the concern of this conference, the results of its deliberations should be of interest. What follows, however, is an entirely independent approach, unconnected with the conference.

Forecasting

A child entering school in 1986 can be expected to play the part of a useful member of society only after 2000 A.D. Hence, the education imparted to the child must be designed in terms of society as it is expected to be after 2000 A.D. This calls for technological and socio-economic forecasting which, as already mentioned, can differ from country to country. A reasonably valid generalised view of the scenario for 2000 A.D. for most countries is being presented in what follows only for purposes of appreciating the discussions to follow.

Inadequate control of population will create serious problems on the food and health fronts, requiring a specific orientation of school science towards agriculture and preventive medicine. Bringing the entire population of a country divided on tribal, caste, language or religious lines together into a single mainstream of national life, especially when many cannot be expected to be even literate, needs better broadcasting addressed to each small region in the language or dialect of the region, and telephone facilities within easy reach of all. The way of thinking resulting from the use of computers will spread everywhere. Tolerance limits in machine-produced items will be very much narrower than they are today. Many new materials will be available. Economy in the use of materials, consumption of power, use of potable water, etc., will assume great importance. Quicker installation of equipment and its testing, utilisation of waste, a significant level of environmental pollution and upsetting of ecological balance, will be some of the notable features of the early 21st century. Employment at lower levels may provide less opportunity than hitherto for the display of initiative or for taking decisions and work may become increasingly monotonous.

Technology recognises four classes of workers, viz., unskilled workers, skilled workers, technicians and technologists. The relative levels of demand for these classes has a bearing on the role of school science. Even in agriculture, the demand for unskilled and illiterate labour will decrease. Skilled workers must be mentally prepared to learn, even on their own, new jobs and move to them. Apart from similar qualities, technicians must have proficiency in an international language like English and must be capable of innovating to fill gaps between old and new techniques, etc. Technologists, including management personnel, must be familiar with the use of computers, statistical methods, etc. It is their responsibility to reduce pollution, present upsetting of the ecological balance, and more generally, everything that harms society. They have to instil in society a sense of duty and of social purpose. They have to persuade those concerned to move to new technologies and guard against obsolescence.

Capacity for logical, orderly and exact expression, ability to properly comprehend technical literature, often in a language other than their mother tongue, and proper realisation of social responsibilities appear to be prerequisites for skilled workers, and, to a much greater extent, for technicians and technologists.These qualities have to grow from education at the school level.Hence, the humanities and social sciences cannot be sacrificed in favour of injecting more of the needed science into the curriculum.

So far as science is concerned, the forecast indicates that much greater attention has to be paid to applications. In addition, there is need to move children at school even directly into technology. In addition to understanding 'current science', children must get trained to understand, on their own, any 'science to come', and develop the capacity to look for applications.

Science at school

School science must develop the mind so that it can comprehend the problems to be faced at least two decades hence. Its information content must be adequate to make the individual feel familiar with scientific, technological and socio-economic conditions prevailing then. This requires the pruning of the existing framework to eliminate repetitions and adding material which is a must for the future. On this basis, school science should comprehend materials science, which will include physics and chemistry, life sciences, electronics and mathematics. Mathematics should project itself towards statistics, numerical work, graphs, and drawing. Electronics must include computers and communications. Life sciences must include nutrition, pollution and genetics. Materials sciences must project itself towards new and useful materials without neglecting the basic essentials of physics and chemistry. In all cases, the stress has to be on experimental work and the importance of accuracy. The 'discovery' approach, if adopted, can sharpen the powers of observation and capacity to generalise from data. All this can be done by utilising a third of the school time available for science. But, science should be taught as one unit without compartmentalising it. How it should be split between the primay and the secondary stages, and, whether the content of the primary stage should be complete by itself are matters of detail. However, it is desirable to make the content of each year's work complete in itself, with a well specified core of objectives and information.

The need for injecting technology directly cannot be met in the time available. However, there is a way out. By slightly increasing the number of working days in a year and the number of school hours per week, it should be possible to get about 10 per cent additional time. This can be utilised directly for the purpose. It is ideal to introduce a new subject, 'Everyday Science'. This will deal with both the principles and applications of science to engineering and technology. Thus, Faraday's laws of electromagnetism could be taught followed by their applications to make motors, generators, transformers, etc. There should be hobby workshops, visits to factories, museums, etc. The subject should cover generally 'man's needs and responsibilities'.

In both science and everyday science, advances are taking place with the speed of lightning. While startling discoveries cannot be anticipated, normal development can easily be visualised. Consider, for example, the next thirty years. It will be increasingly possible to make materials having a specified set of physical properties. In electronics, one may realise a second generation computer within a volume of one cubic inch. Two-way communication to tens of kilometres may be possible with transceivers smaller than a match-box. Genetics may throw up breakthroughs. In atomic energy, it may become possible to utilise 'fusion'. Everywhere, better standards of purity and improved methods of testing, including non-destructive testing, may emerge. All such investigations may lead to advances in science, in addition to valuable applications. Because of the current speed of progress, it is now no longer possible to think in terms of periodic reviews and revision of courses. A normal course will now be subject to an annual review followed by a revision of courses where and when it is necessary. It is this need that brings in 'curriculum dynamics'. Obviously, additions have to lead to deletions or de-emphasis of some areas already included so as to maintain a balance and avoid an overload.

There is an erroneous view that school science need not include the latest development. School science is a composite entity attempting to present even the latest developments but in a simple way. It is the presentation that differs. Further, at the school level, elaborate details and complex analytical derivations get cut out.

Curriculum dynamics

Even today, every aspect of school science is under constant review and revision. But this is not within a set time-frame. Action is sporadic. This often makes the changes too drastic, causing a considerable amount of stress and strain on all. Further, it is not based on socio-economic and technological forecasting of the shape of things to be, say two decades hence. To this extent, it does not precisely meet the needs of purposeful education.

Curriculum dynamics infuses system and method and stipulates integrated action. It adheres to a normal load on an average student handled by an average teacher in a school with average facilities. It eliminates separate provision for repeaters as annual changes are small. Curriculum dynamics envisages an annual review and consequential changes where necessary in

1. Socio-economic and technological forecasting,
2. objectives,
3. courses of study,
4. instructional procedure,
5. textbooks and supplementary literature,
6. teaching aids, including sound and vision broadcasting, and,
7. evaluation procedures.

Annual changes may be very small, but when examined over years may become quite significant.

Curriculum dynamics provides an integrated approach to school science, laying special emphasis on the impact of any of the items listed on the others. A few typical problems of curriculum dynamics are analysed in what follows under three headings, viz., academic aspects, administrative aspects and dissemination of information.

Academic aspects

The techniques of socio-economic and technological forecasting are still at an elementary stage. They cannot yet indicate year to year changes. Further, many countries may lack the necessary data. But, the situation is expected to change. However, there can be advances in pure science and mathematics, and, in educational methodology, etc. Overall, there is bound to be some change worth taking notice of. A set-up in an educational research organisation must carefully scrutinise the information on forecasting available in other organisations, including those in other countries, synthesise the information and indicate the implications. Developing the mind by itself does not change, but slightly orienting it in a certain direction does; information content and its applications do. To this extent, the objectives can change. Courses have to undergo modifications in terms of deletions, additions and alterations, called for through possible generalisations. Instructional procedure have to undergo consequential generalised changes, particularly from the standpoint of emphasis.

Teaching methods may themselves change. Till about 1920, textbooks were written by specialists who gave an integrated exposition in their own inimitable way. Currently, the approach is quite different, particularly for purposes of 'purposeful education'. Books are now prepared by teams. There is scope here to improve coherence, language of exposition, utilisation of diagrams, charts, tables, etc. If financial considerations prevent the republication of textbooks every year, attempts must be made to issue supplements. Supplementary literature, at least through additional booklets, can always be published. In addition, for the use of teachers, teaching units must be published every year on new material injected into the courses of study. For this specific purpose, teaching units are neither outmoded nor irrelevant. Teaching aids, TV lessons, etc., can always be improved and they have a special place for new material added to the courses of study. Since all schools are not within reach of TV stations, it is desirable to produce video tapes also. Research has shown that seeing and listening is much more effective than seeing only. In radio broadcasts, demonstrations and diagrams cannot be used. Hence, sound broadcasting has only a limited educational utility.

The number of question papers to be set per day, the time duration of each question paper, the number of questions to be attempted, the choice of questions, the relative distribution of questions between objective, short answer, essay type, direct calculations, drawing, sketching, etc., is still under examination. Testing for innovative and creative capabilities is not outside the scope of achievement testing but it continues to be an intriguing question. Hence, there is always scope for improving examinations.

Administration

The discussion in this section is based on certain assumptions which are either valid for the current situation or can easily be implemented. There are public examinations after 7, 10 and 12 years of schooling. Since they tend to divert the interest of students from the real learning process, it is best to have just one examination at the end of 12 years of schooling. There should be three statutory boards set up by Government, viz., Examination Board (EB), Research and Training Board (RB), and Schools Administration Board (SB). It is not desirable that an individual should have to deal with the work of one or more boards single-handed as there is need for discussion and composite thinking. However, each board must have a principal academic and executive officer who will be referred to here as 'Director'.

For curriculum dynamics, the RB becomes the pivotal board. It should set up a committee consisting of the three immediate past directors of the three boards for curriculum dynamics work. (Past directors are suggested as they are more likely to spare the required time.) The committee should be assisted by a separate set-up headed by an academic officer of distinction. This officer has to get the real work done, like culling out information about technological and socio-economic forecasting, its consequences, revisions called for, etc. It is very important that this officer gets the benefit of advice from university level professors in the sciences and technology. Controversial issues need a thorough discussion by the committee before finalising any recommendation. The minutes of the committee should be studied by the director of the RB and then forwarded to government for approval. Initially, this committee has to prepare courses of study for adoption by the EB. These should be worded in general terms and must be as brief as possible. In addition, after examining changes, detailed write-ups of courses should be prepared and made available for the teachers for their use. Other details discussed in section 6.1 must also be attended to by the committee. Thus, the Examinations Board should confine itself to the administrative work connected with the conduct of examinations. Even getting textbooks written becomes the responsibility of the RB. The Schools Administration Board should confine itself to inspection and supervision, appointments, etc.

The Curriculum Committee has to set a proper time frame for work and enforce it. Although it is concerned with all the 12 years of schooling, the changes needed each year at the primary level or the first seven years are expected to be extremely small as this stage is more concerned with the development of the mind rather than information and its applications. However, in the initial stages, special attention will have to be paid to everyday science.

Dissemination of information

Often, school level education collapses because of several deficiencies in this sphere. Red tape delays the transmission of information and this defeats the very purpose for which the information is sent. Often, several officers/boards have to scrutinise material, amend it and then forward it. The correct procedure has to be to forward all materials approved by the Curriculum Dynamics Committee and Government directly to the schools. Where possible and where arrangements do not exist, plans should be drawn up to issue a monthly news bulletin in the languages deemed appropriate. This bulletin should give details of changes, arrangements made for TV lessons with dates where possible, and other information. In addition, it should have a special feature consisting of brief write-ups on latest developments in science and technology, new developments at the national level, teaching and demonstration innovations, etc. Several copies of such a bulletin must by supplied to each school so that it can be displayed in the teacher's common room notice board, students' notice board and the library. It should be properly documented and copies preserved for reference in the school library.

Teacher education

Like anyone else, teachers have to be trained and re-trained. There must be at least a week-long refresher course every year covering whatever is latest in science and technology for groups of teachers conducted by eminent and active scientists and technologists. Such lectures are best arranged in a university department of education or a college of education of repute. Every five years, teachers should be given 'sabbatical' leave to attend courses in a university or university level college of education.

Actual degree courses in education must pay much greater attention to subject teaching, subject content, applications of science, methods of carrying out experiments with improvised apparatus, etc. Visits to scientific research institutions, engineering projects, factories, museums, etc., must be a part of the work for science teachers. They must be made to write reports of such visits. Arrangements should be made with broadcasting authorities to have a regular programme of lectures by acknowledged experts on innovations and display of ingenuity. Some of them should be made available on video-tape.

The Indian scene

At the Union of India level, there exist the National Council of Educational Research and Training, the Central Schools Organisation and the Central Board of Secondary Education, which can together be effectively adapted to carrying out the tasks indicated in this paper. There are corresponding organisations in the states of the Union. The NCERT has already moved considerably towards change and can take up the task. What is now wanted is the identification of a handful of men committed to the task and qualified to innovate to move the country forward.

Sporadic changes, vague statements on what is wanted, a sincere desire to change, etc., have all existed. Many items discussed in this paper have even been tried. But, scientifically identifying 'jobs' translating them into workable proposals at school level and adhering to a time-frame brings system and method. This is the need of the hour and is likely to be the norm before 2000 A.D.

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Environmental Approaches to Education: a Means of Enlivening Formal and Non-formal Education

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Environmental Approaches to Education: a Means of Enlivening Formal and Non-formal Education

THE TERM ENVIRONMENTAL APPROACH (EA) IS USED IN THIS PAPER TO include a family of related concepts such as Environmental Education (EE), Environmental Studies (ES), Environmental Knowing (EK) etc. In a sense, all education involves "a superior adjustment of the conscious human being to his physical, social and volitional environment" (10). But we are here concerned with only such aspects of education where the appellation 'environmental' is added to an education-related term.

The term Environmental Education has acquired popularity throughout the world from about 1972, since it has been associated with crisis concerns affecting the world community and has been promoted by Unesco and other world bodies. Not so well known is the fact that our late Prime Minister Indira Gandhi was herself an environmentalist and an environment educator of a high calibre. Her address at the Stockholm conference is an eloquent presentation of the environmental point of view, not only of the third world, but also of the whole world in the true futuristic sense. It must also be mentioned that she had a good non-formal environmental education from her father, the written forms of which can be seen in Nehru's letters to his daughter (e.g. 'The Book of Nature'), it is quite fitting that she was awarded the John C. Phillips memorial medal by the International Union for Conservation of Nature in 1984 in recognition of her outstanding contributions in this field, with the citation describing her as "a gifted naturalist from her earliest years; her sense of kinship between people and nature was already developed in childhood" (40). Accepting the award in 1984, Indira Gandhi said: "Mr Phillips was right in the wish that love of nature would bind humankind together as do science, art and literature . . . the great challenge is to ensure that there is no conflict between conservation and development."

Mr. Rajiv Gandhi, who accepted the award on behalf of his mother on 17 June 1985 pledged to continue his mother's work in conservation (39). It may not be befitting to eulogise those presently in power in a paper of this kind, but failure to take note of the great achievement of beautifying the capital's urban environment during the ASIAD and, at the other end of the spectrum, falling into the rhythm of the most disadvantaged tribal groups in the country, would be to overlook a unique endogenous model of non-formal environmental education.

EE, in the sense of awareness, affection and action with reference to conservation and related factors gets the lion's share of attention in the press and other media since it is concerned with questions of survival for the nation and the world. The Department of Education and highly competent applied scientists are involved in the task. Programmes initiated by world bodies are echoed and replicated at national and state levels and in systems with effective internal communication lines, the programmes tend to go down to the school or out-of-school education procedures in some form.

In systems where educational innovation tends to flow from above, such prestigious EE programmes do catch the eye. But there are other environmental approaches which may be quite relevant even without the crisis type EE concerns. Environmental studies is one area where the grassroots teacher is the innovator and developer and in natural systems grounded in earth, new and functional methods of drawing out of the educational potentialities of the environment and using the environment as a basic resource would emerge from the teacher, who would be credited with his own innovation. If experts aware of the intricacies of Environmental Knowing and Environmental Learning are available, these would serve as catalysts or dialectical partners with the grassroots teachers and thus the multi-rooted multi-branched education tree would grow from below and bear rich fruit. Where downward flow is the sole model of innovation diffusion, planting or grafting of ES from above and ignoring the functional theory of Environmental Knowing cannot be discounted. This is a feature which can be expected in any developing system habituated to bureaucratic styles of administration. Where multilingual and multicultural problems are added to the situation one can expect the uniformity versus unity-in-diversity controversy also to feature, overtly or covertly, with the possibility of a dialectical confrontation and resolution, if only the disputation or alternate pendulum-swing-oriented rulings can give way to dialogic levels of recognising and solving problems. Such world perspectives would help us to evaluate our successes and failures and find a way to move forward fruitfully towards the future.

This paper attempts to touch all the three EAs indicated above, but with the recognition that Environmental Studies and Environmental Knowing are typically pedagogic in spirit, where teachers and educational scientists have to get acquainted with the basic knowledge and skills already available and generate new knowledge and skills. When this happens, EE in the best sense, which involves every citizen in some way, with the best professional scientists playing a role from their spheres, would naturally enter the scene and fit into the orchestration with ES and EK.

Present status

Environmental studies

Following the Indian Education Commission Report (1964-66) the curriculum for the ten-year schooling framework, 1975, was prepared by NCERT. The framework envisages that

> In the primary classes, the sciences should be taught as environmental studies; in classes I and II as a composite course including both the natural and the social environment, and later on as two subjects: Environmental Studies I (natural science) and Environmental Studies II (social science). One need not lay down how much of this should be covered in a particular class. The purpose should be not to stuff the minds of children with facts and information, but to sharpen their senses, to enable them to observe their environment and to enrich experiences.

The framework has recognised that

> the environment and experiences of the children outside the school vary from place to place and so the activities provided in the school should also vary so that the edifice of knowledge is built not on abstract concepts alone but also on the solid foundations of experience drawn from the environment of the child. In such a programme an inflexible syllabus cannot be drawn up for the school. (26)

Textbooks and Teachers' Guides (1979) were produced by NCERT for ES in the primary school. In the Foreword by Director Shib K. Mitra, the philosophy of the environmental approach is explained:

> Science education at this stage is based not on the principles of science as the focal point but on an understanding of the environment and its problems through the scientific method. . . The environment itself becomes a learning resource. The simple science processes of observation, measurement, classification and communication can be developed through these activities. Thus the learning of both the product and process of science may be achieved. (24)

Notwithstanding these minor 'touch-ups' the organisation is basically a topic-wise one, and this is most obvious in class V where 'Air and Water' and 'Volume, Weight and Density' come on in their own right. The text treatment is also designed to ensure content coverage though steps are taken to relate this wherever possible with environmental sensitivity.From point of view of content and approach, a revolutionary break does not seem to have been made from the earlier *Science is Doing* and *Come Let us Learn Science*. Whereas some units like 'Living Things' limit themselves to the essential content, some others like 'Our Body' and 'Food' are highly overloaded with content. Content boundaries are carefully maintained between topics, those from other subjects and between ES I and ES II. Open investigatory approaches spilling over the disciplines are not risked.

Yet, within these constraints, apparently accepted, taking into account the total inertia in the educational systems all over the country, there are invitations to look around, observe (plants, animals, soil, rocks, ponds, the sky, etc.), visit, find out, discuss, collect, classify, record, tabulate, list, draw inferences, wonder and try. The intention of putting investigatory questions and leaving the field open is apparent in many cases, but finally a teacher-proof stance prevails and the answer is supplied very often through suggestive questions: e.g., Do you see any bubbles coming out? There are many cases where information is simply supplied. Catechetical QA structures are also occasionally found. The environment, both immediate and distant, is also brought into the text through attractive pictures. Simulation is a favourite technique aimed at developing concepts. But cases are seen where the simulation syndrome takes precedence over the real environment (e.g. the soil erosion simulation and the evaporation in sunlight set-up). Some simulations are improvable in many ways. An application of Piaget's and later environmental-knowing analysis would have helped to discern clearly the child's perspective, the earth perspective and the external space perspective (especially in 'The Earth' and 'The Sky').

Enactive episodes aimed at developing physical science concepts are interesting, but they are improvable in several ways. The pictorial representation of pollution in a pond perhaps focusses unduly on pollution by the poor. NCERT texts avoid premature use of unfamiliar terms which might force attention to themselves and block investigation. Thus 'water-like' is used for liquids and 'bending towards' is used for tropism. (24)

The textbook, ES I, attempts to acquaint the students with their geographical environment and their cultural heritage; to help sudents realise that India is one country and that, in spite of regional differences, Indians are one people.The Guidebook gives clear ideas about how to use the environment for developing the concepts, skills and attitudes related to social studies. While it is realised that, like science, social studies also must take off from the local environment, the national texts find it difficult to identify a local take-off point, as will be seen from the following extract from the Foreword to the Class III text:

> As these [central] schools are scattered all over the country the study of the home state becomes somewhat irrelevant for these schools. As such, the first part of this book tries to provide a bird's-eye view of life in different parts of our country. Also students have been introduced to the times of early man when he began to use fire, cultivate crops and invent the wheel.(23)

While it would be useful to draw a distinction between the difficulty in adopting such books to different home states and the irrelevance of such home states themselves, it must be mentioned that having taken up the task of approaching the subject 'from above' (like Vygotsky's "heavenly concepts") (35), the books have done a good job of taking the pupils all over the country, helping them to vicariously experience (through) description and attractive pictures) different facets of its geography, mineral wealth, development, history, festivals, arts, etc. (23)

NCERT books for the higher classes also contain environment-oriented materials. This is particularly true about some biology texts. It might appear that the books developed in study groups around 1973 may be much more directly environment-oriented than the books produced about the close of the decade. The NCERT books on social science also have a good coverage of environment-oriented topics. (21)

The states have prepared their own books, apparently on the model of the NCERT materials and workshop expertise. In these books the content focus is still more dominant than in the NCERT texts, and there are certain texts where the environmental pretensions are dropped altogether. Even books which reflect the content and approaches of NCERT's environmental studies titles tend to prefer the earlier ones like *Science is Doing*, or cover simply science, history, geography etc., and get away without any major dissonance in philosophy being apparent.

When the NCERT just indicates three states of matter and the concepts of melting and boiling, some state-level books plunge into deeper concepts like melting point and boiling point and precisely define them in terms of degrees celsius. Premature use of Latinised and Sanskritised technical terms etc. are thrown in as early as class III. Some of the non-strengths of the national text books seem to be replicated in all the state-level books. It must also be added that many states took advantage of their natural closeness to the ground by adding some practical, locally specific episodes. Tamil Nadu, for instance, has attempted to develop in teachers skills in improvising with local materials on a massive scale. For geography it has produced taluk-wise and district-wise books for the lower classes. (Gujarat has also done this, but with all the districts in one book.) Kerala has continued with the kit distribution system which had tended to be stopped with the adoption of the language of Environmental Study.

Materials other than texts

One of the implications of open-ended investigation of the environment is that while the content in the text itself can be reduced to a minimum, a lot of information should be available from auxiliary sources to match the progress of the pupils in their investigations. A number of supplementary reading books were produced by NCERT, written in a popular style by leading scientists. Introducing these in the ES period in 1976, Director Rais Ahmed described them as "an attempt to make easily accessible to young minds additional and more comprehensive information in the various areas of science (39). The supplementary readers in science had entered the scene even during the previous decade. Introducing the extremely fascinating treatment of the *Discovry of the Oceans* by Balakrishna Nair, Professor Pant, then Head of the Department of Science Education, called attention to its utility in helping pupils to get acquainted with the marine environment, recalling incidentally the recent awakening in the study of the 'inner space', more conventionally called oceanography, now taking place all over the world and referring to the International Indian Ocean Expedition as an example of such interest. (2) The invitation to investigate the ocean from the romantic setting of the seashore and Venkatesh's excellent analysis of Indian tree forms, which would help the young environmental investigator to walk deeper and deeper into the domain of science (2, 39) are just two instances to show how first-hand materials from top scientists can be potentially useful collateral materials in ES.

Films and slides have also been produced by NCERT and documented. Perhaps the best among these in terms of ES philosophy and technique is 'Learning Through Environment' (coloured), produced by Professor Chaudhri in the Department of Teaching Aids. Apart from the excellent direction and photography, special mention must be made of two key persons in the film: the person who taught the environmental lessons (and also role-played the formal teacher) and the village blacksmith who taught the children some environmental physics. (21) The only improvement possible in the lesson might be to include these two also in the cast as done in developed democratic systems. Such recognition would help students of ES to locate key resource persons very close at hand, instead of looking always for environmental wisdom from the top leaders in capital cities. Besides the documented films, mention must also be made of many films produced in the early days of the Centre for Educational Technology (CET) exploiting the potential in very ordinary situations in the school and around.

Modules and other related instructional materials have been produced particularly by the Regional Colleges of Education of which the work at Bhopal and Bhubaneswar have been documented. (21) Several papers and progress reports have been presented by Atreya, S.N.L. Bhargava et al., S. Bhattacharya, S. Dorai Swami, B.Ganguli, G.R. Ghosh, J.S. Gill, J.S. Grewal, K.B. Gupta, J.S. Rajput, G. Guru, S.C. Jain, U.S. Madhyastha, S.B. Malik, A.K. Mishra, V.K. Raina, S. Rajput, A.B. Saxena, H.L. Sharma, and others. (21)

Non-formal models of education

The dimensions of what is officially designated as non-formal education curriculum include health, environmental studies, literacy, vocations, social awareness and numeracy. The presentation of professor K.G. Rastogi on non-formal education and some of the products of his section would show that understanding of non-formal education in the best environmental sense is available in abundant measure. Cases are also known of materials that are formal in spirit produced under the banner of non-formal education.

The five UNICEF-assisted programmes are also essentially non-formal modes. (21) Of these, the Primary Education Curriculum Renewal (PECR) Project attempts to develop a curriculum characterised by flexibility, adaptation to local environment and its potential etc. Developmental Activities in Community Education and Participation (DACEP) involves the participation of the local community and the cooperation of various departments such as agriculture, community development, industry, health and family welfare and voluntary organisations. Dialogue with Sri R.K. Gupta of this section in the context of some centres in Delhi, Tamil Nadu and Kerala brought home dialogic possibilities with a chance of drawing inputs into it for the cause of education. Observation of the Children Media Laboratory (CML) and Professor Rajalakshmi Muralidharan's collections of toys from all over the country revealed another interesting possibility of drawing out education from children's immediate indigenous environment. Nutrition and Health Education and Environment Sanitation (NHEES) at primary stage is another project in which the environmental relevance is obvious. Perhaps the project in which the maximum amount of materials have been produced is Comprehensive Access to Primary Education (CAPE). A large number of locally specific learning episodes have been collected from all over the country, analysed in terms of learning competency achieved, processed and codified so that it should be possible to monitor learning, given the learner's own style and sequence in learning. Special mention must be made of Professor P.N. Dave's codification of the episodes for flexible non-formal scheduling of the minimum learning continuum and K. Ramachandran's dialogic and locally generative transactions in getting the episodes.

Non-formal education modes initiated by NCERT have been replicated and developed all over the country and in at least two of the projects there are possibilities of feeding in and processing the endogenous learning modes generated from the ground. Particularly striking from the environmentalist point of view are some publications from the State Council of Educational Research and Training (SCERT), Bhubaneswar, with focus on plants and art. Besides the work done at the State Institutes and Councils, a number of voluntary agencies have done excellent work.

The Vikram Sarabhai Community Science Centre at Ahmedabad has concentrated a lot of scientific manpower in the cause of EA, developing both natural outdoor science laboratories and indoor representations of the environment, both realistic and symbolic and bringing out valuable publications on EA. The Aurangabad experience is an excellent example of drawing out high level science from the ordinary rural environment. Perhaps the association which has harnessed the maximum amount of scientific competencies and diffused them on the widest base is the Kerala Sastra Sahitya Parishad, which regularly organises environmental carnivals *(jathas)* and various programmes of awareness and education. (29,30). The saving of the Silent Valley is one of their achievements, though one body of scientists did make out a case for development as against conservation. (20) The Kerala Association of Non-formal Education, among their other activities, has produced some booklets with environmental significance of which special mention must be made of their *Parisara Pathavali* and *Girijana Pathavali* (Readers in Science and for the Tribals) (4,12).

Research

Considering the importance of the subject, the amount of research in this area is meagre. Sixteen relevant research projects supported by Educational Research and Innovation Committee (ERIC) have been documented. (21) Some of these are of a developmental nature, which is as important as truth-oriented research in an area such as this. One topic which appears to be particularly interesting is 'Need-based ecologically determined and chance-oriented system of education for a community nomadic tribe'.

This investigator and students working with him conducted some studies which were devoted to EE or had and EE component in them. Sumathykutty Amma, in a doctoral study of Science Interests, found that rural children have stronger environmental science interests than urban children. This is true of both 'woodsy-birdsy' factors and 'tinkering' factors. Exemmal, Gangadharan Pillai, Leelamma Mathew, Elizabeth Mathew, Mariamma, P.A. Shaharban and C.K. Lily explored this field in various ways in their master's theses. (17)

Exemmal's doctoral study (6) is perhaps the most systematic constructive and controlled study in the area conducted so far. She constructed certain models for teaching school botany using environmental and ethnic resources and tested the efficiency of such models using experimental and control groups matched on several dimensions.The experimental group was significantly superior to the control groups, both in achievement and in attitude scores.An interesting feature is that when the difference between pre-test and post-test were compared for different groups, significant superiority was found in favour of the rural and the lower socio-economic groups. Of greater long-term value than the test result is the lesson model constructed by Exemmal using a deep analysis of learning outcomes in which the structure of the discipline is intersected in very interesting ways with ethnic and environmental factors.

Rajput et al. identified those local resources in the rural areas which may be of immediate use, helped rural teachers to identify the local resources available in the vicinity of their schools, conducted a workshop, prepared instructional material and tried out the approaches in some schools in Bhopal. The experimental group was found to be significantly superior to the control group in environmental awareness. In the achievement test no significant difference was noticed, but then the test was of the traditional category. (28)

Frederick Hopper, for his doctoral study, prepared modules in botany and tested them against conventional methods and against one another. Both the modules constructed and the findings are of great value. For our purpose the most significant finding is that when the different sequences of the sets were tested, the ecology-morphology-physiology sequence was more effective than physiology-ecology-morphology and morphology-physiology-ecology. This suggests that even at the high school level, the priority of the environmental approach gives a grounding to the disciplines and facilitates learning through more structured approaches as a follow-up (9).

Many innovations conducted in various University Leadership Projects in the country have a strong element of functional educational research in environmental science. Some University professors are specially interested in this area. Special mention must be made of Professor S. Krishnaswamy's (Madurai) contributions in environmental science and of Dr. Sharma's (Rajasthan) explorations of ethnobotany applied to higher education. There are a large number of school teachers all over the country who contribute very significant applied studies in this field, which do not manage to get documented. The Science Fairs and Exhibitions organised at NCERT and state levels are a stimulus for students to conduct significant projects in this area. At this level, individual scientists and agencies, formally and informally help the students in conducting environmental science research. The contributions of the Kerala Sastra Sahitya Parishad is outstanding in this field. Students from very disadvantaged areas have been encouraged to set up projects in Conservation, Stemming Environmental Degradation, Exploiting Local Resources, Pollution-awareness, Wealth from Waste etc. and carry away the prizes.

The studies on 'Tapping the "hidden curriculum" (positive) in work experience and folk art forms: A way of positive intervention favouring the very disadvantaged groups' by the present author and his students are also highly significant for environmental education. Besides some project work of the author, special mention must be made of the doctoral work of N.D. Joshi with tribals, Vasantha Srinivasan on music education, and P.A. Shaharban on traditional Muslim culture components as a source for multidimensional models of non-formal education. (16,13,38,32).

A glimpse at comparative ES approaches may be relevant. Many American primary school texts provide project-oriented activities on conservation and similar issues and also use open-air laboratory approaches. At the high school level, Biological Science Curriculum Study (Green version: environmental approach) starts with environmental biology in focus, but does bring in the structured aspects of the discipline in 'natural' sequences. The Soviet primary texts on *prirodovedenie* (nature study) bring in not only investigation, but also cover a lot of content. But then these are complemented by a lot of popular children's books on ES, and also the rich experiences available in the circles, stations and pioneer palaces. The Science 5/13 materials and various other approaches in the UK are characterised by variety, partnership and dialogue, with the grassroots teacher playing an important role. (27) Perhaps more interesting for a system like ours is the experience of a centralised system like that of France attempting to move towards decentralisation and environmental exploration. The Scientific Awakening Activities in the Elementary School developed by Host and his group in collaboration with the pilot school at Morly-le-Roy has yielded a rich and analytic inter-disciplinary taxonomy of learning activities possible when children freely explore the environment. The taxonomy could help the teacher to identify the learning outcomes reached by the pupils during their free exploration. The individual working cards prepared with this taxonomy could help children to work individually towards these outcomes, and help teachers to guide them. (11)

Environmental Education

We have strayed already a little into the domain of EE, since the borderland between ES and EE cannot be sharply drawn, but the latter is obviously a broader concept. A fairly comprehensive treatment of the perspectives, curriculum design, method, materials, facilities and media, youth involvement and community action, evaluation and teacher education is given in the *Handbook of Environmental Education* edited by Saveland. (31) Ceróvsky's definition forms a convenient starting point of the analysis:

> Environmental education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture, and his biophysical surroundings. Environmental education also entails practice in decision-making and self formulation of a code of behaviour about issues concerning environmental quality (31).

Scores of case studies and models of EE are reported in the Handbook. Here we shall highlight only certain very important features. Discussing EE curricula, Saveland analyses the need of the learner to be rooted in a "home environment" from which a scale of expanding awareness will develop—territoriality, communality, motherland, and Mother Earth (31). The recent threat of a Star War would naturally extend the spectrum of EE concerns still wider. Aspects which even fifty years ago were studied at a spectatorial distance have to be now studied with a sense of participation and urgency.

Even those who advocate process approaches would concede that students would need something to enquire about. Using the factors of the physical and social environment, content from many disciplines can be integrated into a comprehensive core. But one should be careful about the level of integration. At the primary stage, observing, identifying and classifying into sets various factors of the environment will be the main concerns. The middle stage will emphasise perceiving patterns of environmental relationships on national and world-wide scales. The upper stage (ages 14-17) is considered appropriate for the comprehension of movements and issues, with an ethical focus. (31)

Galushin and Doraiswami in an EE case study point out that in actual practice "one can hardly find school curricula without any environmental topics in biology, geography and other syllabi". This remark is in a sense prophetic, because when the stream of the Unesco-inspired EE lead paper of December 1981 met the earlier ES textbook stream of the late 1970's (22) it was possible for it to recognise several topics in the current books, which were apparently prepared without the wisdom of the 'Lead'. But Galushin and Doraiswami make a clear distinction between three stages in EE implementation: the 'topics' approach, unit approach (i.e., use of genuine EE units like a nature conservancy course), and the completely integrated approach. (31)

Rudolf Schafer takes up the concept of ekistics, defined in this context as "that field of study, that area of knowledge, and those concepts and values through which man recognises his interdependence with the environment as well as his responsibility for maintaining a culture that will sustain a healthy and sanitive environment", and attempt to integrate the disciplinary requirement with EA. In the conceptual framework from Grade 1 to 6, three conceptual pathways—sciences, social sciences and humanities are recognised. The concept of interdependence is explored in terms of (1) interchange of matter and energy, (2) social interaction, (3) cultural component forms, respectively in the three pathways. The science pathway, for instance is explored progressively at the six levels from common needs of living things, through differences in environment with characteristic features of life, interchange of matter and energy, conversion into characteristic life forms, constant change in environment, to man as agent of change in natural environment. A nearly balanced progression is seen in the other two pathways also. The cognitive-affective frameworks are extended further at the middle and high school stages. (31)

A still more structured EE model is developed in Balzac's 'Environmental Education in the K-12 Span'. A 3-dimensional grid is presented suggesting some major areas of objectives in EE. One of these dimensions is the affective objectives starting from an attitude of inquiring through desires to achieve constructive solutions, sensitivity . . . valuing living things . . . to appreciation of natural beauty and enjoyment in inter-action with environment. Another dimension explores the topical areas starting with soil, air, water, living things, diversity; through change, evolution, energy, technology, pollution and health to historical, social, cultural aspects and music, language and art aspects. The third dimension analyses the process aspects: effective use of the senses, observation, description, measurement, communication, inferring, predicting . . . experimentation, data recording, data interpreting . . . to . . . environmental planning, appropriate social and cultural skills and language and artistic skills.

The K-12 span also presents another model where the objectives (listed in the grid) are set against the educational techniques which include several activities and settings like outdoor lab, EE centres, field trips, media and classroom. The activities classification include: specific topical, topic-integrating, process-oriented, attitudinal, as aesthetic sensitivity etc. leading on to decision making and more complex activities (31).

The methods are also analysed by Saveland in very interesting and structured case studies. The strand approach to EE draws upon the advantages of both the taxonomical and investigative open approaches. It uses five broad, universal concepts as a way of drawing the environment under a total, integrative, 'umbrella'. There are five such concepts or strands: variety and similarities, patterns, interaction and independence, continuity and change, evolution and adaptation. For each of these five strands, lesson suggestions and questions for student discussion have been developed. (31)

A wide variety of methods of EE have been described by Saveland such as walks, outdoor lab setting, carnivals, exhibit tables, discussions, investigatory questions, projects, competitions, theatre, street festivals and street seminars, and even computer-based resource units for EE.

Youth involvement takes different forms in different countries. In socialist countries like the USSR and Poland, not only is there massive involvement of youth in conservation, projects, campaigns, surveys and allied tasks, young persons are also involved in multidisciplinary complex research projects. Wild life clubs are very popular in some African countries like Kenya.

Where teacher education for EE, appears to be effective, there are high interdisciplinary and extramural components, e.g. the cross-cultural Learner's Centre, Ontario, the Soviet teacher training institutes organising expeditions to flood lands, reserves and virgin forests, ecological and botanical investigations. (31)

The dialogue organised by world bodies like Unesco developed EE into a movement. Johnson traces the stages through which awareness of cooperation in EE was developed. The Stockholm conference (1972) wanted education to promote "new perceptions to guide the new patterns of behaviour between man and environment, and between man and man", which were required by the emergence of his capacity to use and alter his environment on a scale hitherto unknown. The Unesco UNEP International Programme for EE (1975) was one among the many concrete steps which emerged as a follow-up of the conference. The Belgrade International Workshop (1975) resulted in a global framework of goals, objectives, audiences and guiding principles for EE. The Belgrade charter underlined the need to create balance and harmony between humanity and the environment, but also the inherent pluralism of societies in the satisfaction of that need. The Tbilisi Declaration (1977) stressed not only the need for ecological balance in nature, but also

> . . . solidarity and equity in the relations between nations as a basis for a new international order; a holistic approach to EE, noted in a broad interdisciplinary base, to produce a perspective of interdependence between the natural and man-made environments; and EE as a lifelong education for individuals as members of the community in an active problem-solving process, encouraging initiative, a sense of responsibility and commitment to build a better future.

Explaining the rationale for international cooperation, Johnson emphasises that EE should promote and sustain a world-wide dialogue, stressing the ecological principles that go far beyond idealogical and political boundaries. He identifies three target populations for EE: (1) the general public (in both formal and non-formal systems); (2) special social and professional groups; (3) technicians, scientists and specialists. (36)

Ignacy Sachs, Director of the International Centre for Research on the Environment and Development, calls attention to "the controversy between the radical ecological movements preaching a self-imposed frugality and the industrialists and developers who attribute the growth of awareness about the environment to middle class sensitivity". According to Sachs,

> Ecologically prudent management of resources and the environment

> forms part of the multidimensional approach to development; it is a further dimension of the latter and not its antithesis . . . If there seems to be no justification for radical ecologism, there is still less reason for runaway economism. Control over economic growth is necessary in order to avoid overpilling the limits and triggering off irreversible climate alteration processes lethal to man or exhausting the resources essential to his survival.

Calling attention to the conflict between a "desire for diachronic solidarity with future generations and a desire for synchronic solidarity with our contemporaries", Sachs explores some possible solutions like the use of solar energy in all its forms, recycling of non-renewable resources, social control of technology to prevent environmental degradation etc. He suggests an ecodevelopmental standpoint which takes a midway position between zero growth and indiscriminate exploitation of nature for immediate profit. (36)

Vidart has developed a detailed theory of EE. He distinguishes between the broad view of EE which is in fact "a pretext for working out a grand theory of education embracing all the philosophical, social and educational ideas that converge to form the 'new education'" and the narrow sense of the term which is rather "a pragmatic response to the defacement of the environment, both in affluent societies, where 'pollution results from wealth', and in the third world, where 'pollution results from poverty'".

Vidart traces the history of EE from the concept of *milieu ambient* put forth by Saint-Hilaire and the environmental determinism which follows from it, through the concepts of physico-chemico-bio-psycho-socio-cultural continuum in emergent evolution, Engel's view of man as "that part of nature where nature becomes aware of itself", the recognition of the importance of reflective praxis, of social action converted into the memory of the human groups, to the different senses in which EE is used by architects, doctors, sociologists, engineers, geographers and anthropologists.

Vidart analyses the ideological connotations of the term environment—as a psychological weapon used by developed countries to discourage industrialisation in dependent areas; as a vehicle for predicting ecocatastrophe by 2000 A.D., as a means of fostering a new attitude to nature; as a generator of projects through an alliance between Utopia and futurology; as an election platform or a mass movement; as left-wing argument against plundering and polluting capitalism; as a refuge for counter-culture groups; and as a subject exploited by popularisers of pseudo-science.

Vidart also distinguishes between broader concepts of education as in 'enculturation' and the narrower 'banking' concepts of education and schooling. EE should align itself with the broader, open-ended, democratic and life-long models of education. Such an EE would be more than the fashions which periodically invade education; it would be a 'Copernican revolution' in education. (36).

Explaining the conceptual framework of a learning environment, Goodswaard points out that teachers can transform 'ordinary environments' into those where active learning, exploration and discovery take place. Once the cognitive stimulation is provided in these environments in an accepting, encouraging atmosphere, "teachable moments" precipitate and serve as catalysts and spring-boards for the eager acquisition of additional facts after the experience. Learning environments should also offer opportunities for affective education. They should also offer "the kind of open structure that takes advantage of the ceaseless and unpredictable happenings in natural, dynamic ecosystem". The difficulties with using these open learning environments are also analysed. (36)

The concept of interdisciplinary perspective in EE has been analysed by several scholars. In this connection Moroni has summarised Jantsch's analysis of the scale of interdisciplinarity, from multidisciplinarity, where a variety of disciplines are offered simultaneously without making explicit possible relationships between them, to transdisciplinarity where all disciplines and interdisciplines are coordinated on the basis of a generalised axiomatics (introduced from the purposive level) and an emerging spistemological pattern. The type of interdisciplinary work which would be relevant at different levels of education are also explored. (36)

Stapp has developed an instructional model for EE which includes the key concept of the 'environmental encounter'—a specific instructional technique which includes definition of the problem or issue, becoming informal, identifying and evaluating alternative solutions, and developing, implementing and evaluating plan of action. A gradient model is also presented in which environmental sensitivity will dominate at the lower levels, whereas factual knowledge, problem-solving skills and philosophy will increase in density with the grade level. (36)

Helen Fessas-Emmanouil, a Greek architect, has explored the case for integrating educational and community facilities. The two-fold function of this integration are: (1) to make education more relevant to community life; (2) to make the school an integral part of the social and cultural services infrastructure. But on the socio-political side, many educational policies aim at "blocking external influences upon pupils" and hence make difficult the task of "opening up the school to the outside world". From the side of architecture and physical planning, a case is made out for the coordination of school and community facilities and for better utilisation of resources, both human and material. Fessas-Emmanouil suggests that now there are two parallel schools: the traditional educational facilities, on the one hand, and the socio-cultural facilities and mass media networks on the other. She suggests that the integration of the school and community facilities is a kind of 'third school' which is not yet taken with sufficient seriousness. Architectural and planning optimism has to be based on the assumption that coordinated socio-cultural and educational facilities would be more relevant to community life than to the school.

Such integrated models have been established in the UK in the form of community colleges and community centres, in the FDR as varied community facilities (Gemeindschaftenszentrum, etc.) and in the US as open schools and community schools. France opened an integrated centre at Val d'Yerres and in other places.

But the school without Walls has not necessarily led to a 'deschooling' process. One reason is that integrated educational and community facilities have failed to promote genuine relations between different social groups and age-groups. The theoretical aspects of this problem are discussed in detail in the rest of the article. (36)

Environmental knowing

Moore and Golledge have compiled, edited and analysed in depth the concepts and theories of environmental knowing. These studies are perhaps as relevant for environmental pedagogy as the analyses of Piaget, Bruner, Gagne and others in modern mathematics and science education. Environmental cognition is defined as "the awareness, images, information, impressions, and beliefs that individuals and groups have about the elemental, structural, functional, and symbolic aspects of real and imagined physical, social, cultural, economic, and political environments." It includes information and beliefs, as well as intentionally misleading information (as in propaganda). It includes spatial-encoded 'images' as well as linguistically encoded 'impressions' about the environment. Boundaries in a city "are not so much physical things as they are the dividing line between two different subconceptions of the city, such as between 'safe' and 'un-safe' areas or 'good' and 'bad' areas; in fact the city of the mind is as relevant as objective statistics about the city". (19)

Moore and Golledge go on to analyse the nature of perception and cognition, the concept of representation or cognitive map as a hypothetical construct useful in environmental study, the assumptions and methodological issues, and the epistemological bases of environmental cognition. The history, origin, development and future of environmental cognition theory and research is also analysed in an inter-disciplinary perspective. Downs and Stea have defined the term *cognitive mapping* as "the process by which people acquire, code, store, recall, and decode information about the relative locations and attributes of phenomena in the everyday spatial environment".(19)

Stepen Kaplan in an excellent analysis of "Adaptation, structure and knowledge" makes out that "cognitive maps, beliefs, even prejudices are not clearly separable portions of the cognitive apparatus. Rather they are all cases in which an individual possesses an internal model of a portion of his environment". His analysis is based on the assumption that the evolutionary environment was uncertain and dangerous. Object recognition, anticipation of future events, abstraction, generalisation and responsible innovation are needed for survival in such an environment. On this basis he discusses the management of uncertainty, information handling capacities and mechanisms, the importance of space, anticipation and the coding of sequences, etc. His analysis of making one's way is particularly relevant for EE with concepts such as, visual distinctiveness, inferred distinctiveness and functional distinctiveness in landmarks and regions. (19)

Rachel Kaplan has followed up the above study with case studies on 'Way-finding in the natural environment'. The ideal is to present a 'future' environment in a way that facilitates envisioning it (19). While applauding Stepen Kaplan's view, that "the environment is not simply that vast unknown which can be seen through the confines of the laboratory window" and Rachel Kaplan's use of a wide range of tools (maps, games and field trips) to effect a true marriage of environmental concerns and the concepts and methods of psychology, Downs parts company with the Kaplans on the question of "In what way is the environment in the head?" He sees a tension between product (map) and process (mapping). He warns against the temptation to slip into the belief that a map is something that people have stored away somewhere in the head. We get dangerously close to treating spatial knowledge as a form of massive but mysterious cognitive atlas.

Downs also shows that Kelly's Person Construct Theory (PCT) might aid in the processes of environmental cognition. He notes that "the environment is not just another variable to be thrown into a multiple regression model; it is the *reison d'etre* of a whole class of behaviour, that is devoted to solving spatial problems." Environmental cognition is a constructive process which generates alternatives (19).

Honickman explores the application to urban design of PCT and environmental meaning. Some major concepts used in the analysis include: laddering (to elicit superordinate or subordinate constructs), repertory grid, resistance to change and implication grids, links (19).

Fishbein presents an evolutionary and developmental approach to understanding how children acquire cognitive maps of the environment. He concludes from a detailed analysis of the works of Waddington, Lorenz and Piaget that the primary short-range function of the acquisition of knowledge, whether in the genotype or through phenotypic acquisition, is to enable the organism to act effectively in the environment. In the present epigenetic approach "learning is defined as a set of functions or processes that progressively organises the individual's future sensory experiences or motor activities or both". (19)

Moore has presented the theory and research on the development of environmental knowing based on a comprehensive reading of Piaget, Werner, Kaplan and others. The interaction of biology, culture and environmental experience, action and transaction, mediation, structure, the process as in the transformation from the global, simple, concrete, undifferentiated and egocentric stage to the abstract, complex, coordinated and hierarchically integrated stage, are the major components in his paper. Illustrations are drawn from the model village and sandbox model of a child's schoolyard and environs as studied by Piaget et al. as well as more complex maps and model landscapes used by other investigators. (19)

Reconstructionistic needs

1. The different aspects of the environmental approaches such as ES, EE and

EK should be developed in an integrated and mutually stimulating manner.

2. The planning of environmental study should start from the ground level with the grassroots teachers as equal partners with experts. The analysis, criticism and reconstruction of the ground experience should go side by side with the planning of theoretical approach papers and lead papers from above.
3. Curriculum planners should be at least as sensitive to the 'ground environment' where the real process of education of children takes place as to the 'upper environment' from which directions are taken and high level seminar proceedings flow.
4. Dialogic competencies should be given at least as much importance as content competencies and method competencies in the training of teachers. At the moment even the process-oriented beginning in writing books gets sacrificed at the altar of content. On the other hand, genuine dialogic competencies would help to draw out relevant process and content from a wide array of resources all round. The dialogic models around enriched forms of Developmental Activities in Community Education and Participation (DACEP) could help in using the various developmental inputs as educational resources. In course of time the 'total school', integrated with the community might emerge.
5. The Comprehensive Access to Primary Education (CAPE) model of flexible scheduling of learning episodes is so far the best model of monitoring own time learning in non-formal settings. However, this may still be based on "the logic of the school". Various environments and ethnic resources in the country may have their own logic. It would be interesting to analyse the hidden curriculum in the situations and develop alternate models of flexible scheduling with school in the background rather than in the foreground (16).
6. The work of the environment department, environment engineers, architects, artists, awareness experts, etc., have to be understood by the educational system, which should be open to a free flow of the basic elements of their analysis into the school. Similarly the ground experiences provided in the school will also serve as basic education for specialised environmental competencies.
7. At present we proceed with ES in two paralleled streams—science and social studies. Art and music courses find a place in the curriculum, but usually as second-class citizens. It would be interesting to examine whether art and music can also be introduced as an integrated subject and as a means of exploring children's outer and inner spaces, and of processing even the cognitive disciplines in joyous enactive-iconic-symbolic sequences.
8. In order to experiment with the above and other heterodox suggestions,

experts in functional interdisciplinary pedagogic theory should work in close collaboration with pilot schools, on a wide spectrum, ranging from the proposed model schools, to some tribal and other disadvantaged schools.

9. Strabo (33) has recorded that in ancient India there were a number of scholar groups such as Brahmanas and Sramanas, wandering throughout the country, learning from its variegated nature and multicultural environment, and rewarded for reporting their findings in the spring festivals. Studies with early Tamil and other sources indicate other kinds of wandering scholars like *pulavar* (poets/wise men), *paanar* (minstrels), *kuuttar* (dance-drama exponents), *siddhar* (philosopher on the street) also performed similar functions, teaching and learning from the populace. Such models have been reconstructed in recent times in the socialist countries, like the USSR and Hungary. The NCERT even now has a built in wandering scholar structure, and some personnel already possess the teaching as well as the learning-from-the-environment competencies. It would be interesting to examine whether a revolution would be initiated if national scholars are asked to report what they have *learnt from* the ground of the educative environment where grassroots teachers are in live interaction with the natural, social and cultural environment.
10. Value orientation would be most effective if started with focus on environmental values like harmony with nature and leading up to more abstract and verbally processed values.

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Needed Research in Elementary School Curriculum

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Needed Research
in
Elementary School Curriculum

THIS JOINT STUDY OF TRENDS, DEVELOPMENTS AND ISSUES IN elementary education has generated some themes, topics and issues for further research. Their significance lie in the fact that they have been identified in the field, especially at the grass-roots level, and have been chosen after deliberation upon their relevance and usefulness at the international level. The nature of research varies from topic to topic. Some are of a philosophical nature; others are pedagogical. Some relate to quick surveys and in-depth studies, whereas others are operational, developmental or implementational in nature. Some of them lend themselves ideally to be taken up as case studies, while others may call for empirical research based on hard evidence. Some are admirably suited to action research. Needless to say, these studies are suitable for efforts at local (*i.e.* school/teacher), national and international levels.

The research topics that are predominantly philosophical in nature could be, for instance, the nature, process and product of integration itself. An example of a primarily pedagogical research could be the issues such as when, how many, how long and with what effect can multiple language teachers/multilinguism be introduced at the elementary school stage. How early childhood and elementary school curricula are developed in different countries of the region can be examples for the undertaking of quick surveys. The traditional versus the integrated approach in the teaching of social sciences/social studies could be a topic suitable for undertaking an in-depth study in its various dimensions. A fitting example of operational, developmental or implementational research could be the steps involved in developing and trying out graded textual and instructional materials for pupils.

In the awareness that the hidden curriculum is a most difficult concept in classroom instruction, it would be worthwhile to undertake case studies of teachers to discover what different personal values they preach and impose unknowingly on their pupils and with what effect.

Recognising that most of the countries in the region have been advocating in one form or another the importance of integrated curriculum/materials/teaching etc. do we have hard empirical evidence to support the theory that an integrated approach really helps the child to study? It can be a highly interesting topic for conducting empirical research to help educators clarify one of the basic pedagogical assumptions of our times. To promote action research, teachers can be encouraged to select a suitable abstract theme like democracy or government and break it up into a series of small, simple concepts to be developed in a sequential manner for determining their grade placement. It may serve as an example of suitable action research at the elementary school level.

If topics of action-research and case studies can be taken up at the local or school level, the research connected with identification of local raw materials and resources, employment potentials for certain jobs or trades, development of materials and work oriented curriculum could be taken up at regional or national levels. Certain selected empirical researches, particularly of a cross-cultural nature can be ideally taken up at the international level in the form of joint collaborative research projects. Empirical/pedagogical researches can lend themselves admirably to suit this particular category. For example, such researches could be in the area of: (1) the impact of multilinguism with all its strengths and weaknesses on the development of the child's personality; (2) integrated approach in relation to the child, his ability to learn and the pace with which he does so; (3) how values are introduced, clarified and developed; and how effectively and objectively they can be measured in terms of actual behaviour of the child; (4) how to measure non-cognitive achievements of the child in the area of work education; (5) does integrated curriculum necessarily help in lightening curriculum load both on pupils and teachers and if so to what extent; (6) values of the child in a formative stage are inculcated and moulded by (a) the home and family, (b) teacher and school, (c) community and society, (d) peer group of a child, (e) society and the powerful, all pervasive mass media to which the child is being increasingly exposed. Can the contributions of each of these institutions be identified and measured at different developmental stages of the societies?

Given below is a brief outline of suggested researches in each of the major areas of study, namely (1) integrated curriculum, (2) moral/religious/values education, (3) work oriented education, (4) curriculum load, and (5) general problems or common concerns. These are not detailed research designs. Nor are they exhaustive or of a prescriptive nature. At best they are primarily suggestive and somewhat provocative in nature.

Integrated approach to curriculum

A cross country study on procedures and techniques adopted in integrated approach to curriculum development and its evaluation at elementary stage

The study should address itself to some of the following points:

1. Centralised versus decentralised curriculum development.
2. Integrated curriculum development vis-a-vis correlated or integrated teaching.
3. Integrated teaching vis-a-vis integrated learning.

4. Integration: process versus product.
5. Integration: teacher and pupils.
6. Integration: method versus material.
7. Comparative study of end products of:
   (a) integrated curriculum, materials and methods, and
   (b) integrative or correlational teaching.

Some of the hypotheses to be tested could be as follows:

1. Local specific, environment-oriented and relatively text free curriculum would be more lively and effective than the global, highly centralised and text dependent curricula at the elementary school stage.
2. Integrated approach to curriculum is possible only when integrated curriculum and materials, particularly the textbooks, are readily available.
3. The crux of integrated curriculum lies in helping the child to analyse and synthesise life experiences.
4. What is important in curriculum transaction is not the passing of an integrated capsule or a dose of information but a steady development of an integrating mind.
5. The development of the integrative mind of a child takes place when he is not simply taught, but helped to learn individually and incrementally.

Traditional versus integrated approach in the teaching of social sciences/social studies at the elementary stage

The scope of the study may include some of the following points among others:

1. Plethora of facts versus important generalisations having relevance to life.
2. Mastery over facts vis-a-vis development of citizenship.
3. Structure and the spirit of a subject as a way of knowing versus becoming engulfed in facts, figures, names and dates, etc. (Factual versus conceptual aspects).
4. Judicious blend of analytical and synthetic approaches.
5. Strengths and weaknesses of integrated and traditional approaches.

Among others, some of the following hypotheses may be tested:

1. The child should know not only how to integrate but what and from where to integrate.
2. Subjects are a mere bundle of awkward and outmoded facts irrelevant to everyday living.
3. Subjects represent a fund of human knowledge which is not to be simply

transferred to the next generation but to be further enriched and simplified before doing so.

4. Subject vis-a-vis integrated approach is solely and either-or proposition.
5. Subject approach makes teaching-learning lifeless and monotonous.
6. Integrated approach necessarily and invariably helps in adopting a problem-solving approach.
7. Integrated approach helps pupils to learn individually and in groups.

Is the integrated approach necessarily helpful to the child in learning with ease and necessary pace at the entire elementary stage?

The research study may attempt to address itself to the following issues:

1. Integrated approach and the nature of learning.
2. Integrated approach and the quantum of learning.
3. Integrated approach versus learning skills.
4. Integrated approach vis-a-vis synthesis of knowledge.
5. Integrated approach and value clarification.
6. Comparative study of a controlled and experimental group under two approaches.

The hypotheses to be tested could be as follows among others:

1. Integrated approach makes learning interesting, appealing and lively to the learner automatically.
2. Integrated approach lightens the load of learning considerably.
3. Integrated approach is synonymous with systematic development of learning skills.
4. Integrated approach takes care of not only integration of knowledge but also of its sources and mastery over them.
5. Integrated approach can be extended with profit to the entire elementary stage.
6. Integrated approach makes the child more analytical and simultaneously results in synthesising his knowledge from extremely diverse branches of knowledge.
7. Integrated approach is highly useful in value clarification and in bringing about behavioural change correspondingly.
8. Integrated approach makes a child a better and faster learner.

Development and try-out of curriculum and textual materials at the elementary stage.

The study could be taken up either at the centralised or decentralised level or even at both levels simultaneously.

It should take into account among other things:

1. The composition of a team or group representing varied expertise to do the job.
2. Procedures and steps to be followed in developing curriculum documents.
3. Developing suitable instructional materials by a group of teachers and experts.
4. Group criticism and editing of the materials.
5. Trying out materials in schools selected on a random sampling basis.
6. Evaluation of materials in the light of feedback received from pupils and teachers.
7. Comparative evaluation of materials developed under centralised and decentralised systems.
8. Finalisation of the materials after suitable editing including illustrations and exercises.

Undertaking longitudinal studies to find out whether separate a subject approach or an integrated curricular approach pays greater dividents in the long run

In an integrated. curriculum approach the emphasis is on deriving information from diverse sources and relating it to a problem on hand. It makes study more functional, meaningful and interesting. As against this, there is more rigorous training in basics or disciplines. These are not only the bodies of systematised knowledge. They also represent a way of knowing, reasoning and deducting. Subjects not only store or provide information at one place but they have also an added advantage of helping in disciplining of mind.

The hypotheses to be tested therefore could be:

1. Does the teaching of subjects help in development of reasoning and thinking processes in addition to knowledge of a set of facts?
2. Can a learner with adequate subject background correlate and integrate information more effectively and with relative ease as he grows?

The method to be adopted to test these hypotheses or questions is to take controlled and experimental groups taught in two different ways for seven or eight years of elementary education, and then test their proficiency in correlation and integration of information, skills in reasoning and abilities in problem solving, when they would be either in post elementary classes or in the work force.

Moral, religious and values education

Identification of hidden curriculum: case study

Teachers may be identified on a selective random basis taking into account their (1) sex, (2) age, (3) rural/urban location, (4) income group, (5) social or educational status, (6) religious/denominational background etc.

For a specified period at regular intervals their classroom proceedings may be tape-recorded. This should include games period and co-curricular activities including their free talk with children during free time or recesses.

These then should be played back and analysed keeping in view the following points:

1. Attitude towards opposite sex.
2. Democratic or other norms of behaviours while dealing with children.
3. Cases or occasions of possible favouritism or discrimination on specific grounds.
4. Bias, if any, towards their own religious group or its teaching etc.
5. Political or ideological obsessions if any.
6. Concern or otherwise for fair play and social justice.
7. Attitude towards slow learners, socially backward and culturally deprived children.
8. Their approach and attitude towards their colleagues, management and community at large.
9. Weakness for imposing their own likes or dislikes, views and opinions on children indiscriminately.
10. Betrayal of insincerity, shirking responsibility and displaying selfishness or the opposite of all these things.

Evaluation of pupils achievements in the non-cognitive area especially in the affective domain—values and attitudes

This could be done with the help of attitude or rating scales (with four or five points). Alternatively it could be accomplished by careful observation of pupils' behaviour in and outside the classroom, on the playground and in various curricular and co-curricular activities.

Children can also be made to project themselves in certain imaginatively planned situations.

Simulation is therefore, another technique that can be used profitably.

The relative role of home, school, community and mass-media in moulding children's value systems and behaviour

The following points could be taken into consideration to ascertain which agencies influence or mould children's behaviour and to what extent:

1. Parents/family and children's value system and mode of behaviour.
2. Peer group and children's value system and mode of behaviour.
3. School and children's value system and mode of bahaviour.
4. Community and children's value system and mode of behaviour.

5. Mass-media—films, television, radio, press, community entertainments, advertisments—and children's value system and mode of behaviour.

The following hypotheses need to be tested:

1. The home has the most dominating influence in moulding the child's values and behaviour.
2. The child, before it enters the school, has already adopted most of the values cherished and practised in the family—by parents, brothers and sisters, and other members of the family.
3. The child makes his peer group a reference group to determine his/her values and behaviour.
4. The child's values, behaviour and personality traits are influenced and moulded by the response he/she receives from the peers, family and school for his/her performance and achievements.
5. The child's values and behaviour are developed and moulded exclusively by the teachers, the school and the textbook.
6. The child's values and behaviour are developed and moulded not by home or school but exclusively by the community or the society at large.
7. The child's values and behaviour are developed and moulded exclusively by the most powerful and all pervasive mass media—films, television, radio, press, platform, comic books, other books etc.

Effect of elementary schooling on creativity and thinking processes of children

One of the cross-cultural studies that could be jointly undertaken as a follow-up action could be on the way divergent thinking could be promoted among pupils at the middle or upper primary stage.

The present study has shown that there is almost universal concern to see that the moral fabric of every society irrespective of its faith and socio-economic condition is strengthened. Countries, therefore, have almost invariably laid emphasis on religious or moral or values education. There cannot be any quarrel in so far as it helps in making every would-be citizen more humane, more sociable, more law abiding etc. However, there is yet another important concern and aim or goal of education to see that a child develops his total personality to the full. He or she becomes creative and original in thinking and self expression. Hence there is a need to initiate conscious effort to see how elementary education, particularly in its later part, can promote original, creative and divergent thinking and help the child to develop courage to stand by his views and convictions.

Work oriented education

Exploring the potential of work as an effective medium of instruction and its relationship with preparation for life and the world of work

This philosophical/pedagogical topic is of great significance not only to the individual child but to the society as a whole in moving forward at a faster pace.

In some of the Asian countries education historically has been a preserve and exclusive prerogative of the few, particularly the privileged classes, who saw to it that it was their monopoly. They also buttressed a value system in which intellectual work alone had a place of pride and all manual work, which was denigrated was for the illiterate masses. Over centuries two worlds have been developed, one having access to and mastery over literary culture, tradition and every kind of facility. There is a tendency on the part of this privileged class to perpetuate if not widen this gap or chasm between the two.

Against this socio-economic background it is important that the potential of work as an effective medium of instruction and expression is fully and systematically explored. The dignity of manual labour and its educational potential and value have been established not only for the masses but also for the classes or white collared sections of the society. A new work ethic has been initiated and nurtured.

The study therefore should deal with the following aspects of the problem:

1. Work as a medium of self-expression.
2. Working with hands to investigate, understand and express concepts, ideas, principles etc.
3. Developing coordination between head and hand.
4. Interface between work and education.
5. Work as an entry into the world of work.
6. Work and work ethic.
7. Work and productivity.
8. Work and work skills.

The hypotheses to be tested could be as follows:

1. Work is as important a medium of expression and communication as, if not better than, the spoken or written word.
2. Working with the hands can be a means to develop an investigative spirit and to understand concepts and principles and thus lead to intellectual growth which need not be confined exclusively to literary skills, abilities, and a connected value system and a way of life.
3. Education can best prepare one to enter the world of work through initiation to work, development of work skills, cultivation of the work ethic and through the creation of productivity consciousness.
4. Even those who believe in white collar culture can benefit intellectually and otherwise by acquiring work skills, adopting the work ethic and accepting dignity of manual labour.
5. Work education can go a long way in developing a balanced and all-sided

personality making the child a better worker not only individually but socially as well.

Conducting district level surveys to assess new materials, local resources and employment potential along with growing manpower needs

Since one of the purposes of education is to prepare children for their entry into the world of work, particularly for children from rural areas and urban slums as they may not be in a position to continue with their formal education beyond elementary level, it would be desirable to conduct in-depth studies and surveys at the district level.

The study should take into account among others the following aspects:

1. Development of a check list of natural resources including raw materials.
2. A check list of local institutions or agencies that possess technical knowhow and resource persons.
3. A survey of manpower needs at (i) unskilled, (ii) semiskilled, (iii) technical and intermediate or appropriate technological levels.
4. Preparation of a checklist of common general work skills that would be required for a wide variety of jobs.
5. Development of curriculum or syllabi for more popular jobs with considerable job market potential.
6. Development of tool kits/workshops etc. to train necessary manpower.
7. Listing all places of work where on-the-spot training can be imparted.
8. Model legislation compelling private and public industrial establishments to accept trainees or candidates to provide apprenticeship and on-the-job training and experience.
9. Develop in-built evaluation systems to constantly review work in all the above-mentioned departments for their continual revision, improvement and refinement.

Curriculum load

To assess whether the integrated approach to curriculum can help in lightening curriculum load, and if so, to what extent

The study should take into account the following:

1. Integrated approach at curriculum development level.
2. Integrated approach also at the textual material level.
3. Integrated approach at the teaching level.

Of the three possibilities which one has a greater potential to lighten the load on:

(i) teacher only;
(ii) students only; or
(iii) both of them;
and if so to what extent?

4. Is it necessary and profitable to do work at all the three levels, two levels, one level or none?

A study to investigate the phenomenon of multilinguism and its pedagogical implications

In several mono and multilingual countries, both developed and developing, there is a growing trend to encourage the study of more than one language, sometimes up to three languages. These may be the mother tongue of the child or the local language, a regional or state, Union or federal language and a foreign or international language, not excluding a classical or a religious language of the group to which the child belongs.

The maximum load of studying languages, and that too on a compulsory basis, is at the middle school stage or at the upper primary level. These load is somewhat reduced at the secondary/senior secondary school level when children are required to study only one or two languages.

The study should attempt to provide scientific answers to the following questions:

1. Which is the ideal period physically and mentally to introduce the child to reading and writing? (Whether early introduction to reading and writing would have adverse effect on the child's eyesight and general physical growth etc.?)
2. Which is the ideal period in a child's life to study a new language other than his/her mother tongue?
3. How many languages can a child learn simultaneously and at what specific age level?
4. Is it desirable to introduce the study or two new languages simultaneously?
5. What is the desirable stage in a child's life to study (i) a second language; (ii) a third language; and (iii) fourth language?
6. What is the minimum duration (number of school years) for a child to study the language to be able to use it as:
    (i) a library language;
    (ii) language for expressing onself; and
    (iii) language (other than mother tongue) to be used as a medium of instruction?
7. Does transfer of training take place when one begins to study more than one language?
8. Does multiple language study help or hinder intellectual growth or thinking/analytical ability of the child?
9. Does exposure to more than one language promote a broad and more catholic outlook? Is there any hard evidence to this effect?
10. Does the use of foreign language as a medium of instruction cripple original or creative thinking? Or is it the other way round?

11. Are there tried techniques and tested methodologies of teaching or learning foreign languages more expeditiously and effectively? What are they?
12. To what extent and with what effect can audio-tapes and language laboratories be used in the study of foreign languages? If so, how can those aids and techniques be had at reduced costs to be within the reach of large numbers?

General topics of common interest

These research topics are essentially of developmental or operational in nature.

How effective are in-service teacher training programmes in motivating teachers, imparting skills, up-dating their knowledge, and changing their professional behaviour

The question is of great universal significance as it cuts across political boundaries and the socio-economically developed and developing status of societies. The aspects to be investigated are:

1. Can certain indicators of professionalism be identified and a suitable checklist of the same be prepared?
2. How to develop necessary tools, rating scales etc. to assess probable gain in motivation, competencies, knowledge and perspective and professional growth?
3. How effective and reliable could be pre-and post-tests generally administered for the purpose?
4. How and what kind of follow-up action can be taken to ensure that interest generated in them is sustained?
5. Can correspondence and contact courses be made a regular feature with academic and other rewards if possible?
6. What are the characteristics of professionalism and can they be inculcated and evaluated?
7. What kind of evidence should one look for to identify and assess change in the professional behaviour of teachers?
8. Can the effectiveness of in-service training of teachers be correlated with ultimate improvement in students' achievement levels that can be ascribed essentially to in-service training of teachers? If so how?

Use and assessment of mass-media for in-service training for teachers

As the numbers of teachers to be provided with in-service training at regular intervals very often run into astronomical proportions, an increasing amount of faith is placed on the use of mass-media for the purpose. The sheer economics of the tasks involved leaves no other possibility to explore.

The questions to be probed into could be:

1. How far television, radio, educational films, film-strips, slides with taped commentaries, newspaper columns and supplements meant for teachers and students can be effectively and imaginatively used in effecting in-service training of teachers?
2. How and with what optional periodicity and actual duration of programmes can each of these be utilised?
3. Can these help in creating a social climate that would motivate parents and society to ensure that schools do make effective use of these facilities and that even children can persuade teachers to discuss with them such educational programmes for clarification of their doubts etc. if any?
4. How can teachers be made aware of these programmes, and motivated to follow them up with the necessary interest?
5. How to assess gains of teachers and give them due recognition for the same?
6. Can teachers be encouraged to participate in planning, development and assessment of such programmes on a large scale?

Problems of single teacher schools—ungraded classes and multiple class teaching

This is an important problem in quite a few developing countries, particularly in Southern Asia. A single teacher has to manage not only a large number of pupils simultaneously but a heterogeneous group cutting across several classes simultaneously.

The questions to be investigated could be as follows:

1. What is the rationale and justification for having ungraded classes particularly at the lower primary level, especially classes I and II?
2. What techniques and methodology or procedures do teachers follow in handling multiple class systems, very often from classes I and II?
3. How effectively can the teacher keep children of various classes meaningfully busy and help them to learn by themselves under guidance or supervision?
4. In what way and to what extent can the teacher utilise the students of higher classes in helping their younger brothers?
5. Can this opportunity of asking senior pupils to help the junior ones be utilised also to motivate them to learn on their own?
6. Can teachers be given some aides or helpers in doing his/her job? To what extent can the community be involved and its resources used at its maximum?

Taking care of slow learners, the handicapped and the gifted children at the elementary level

This is an important aspect of education and has social and pedagogical implications. A teacher, particularly in a small single-teacher school, is at a great disadvantage and under pressure to be able to attend to this task effectively.

The problems that need to be looked into on a practical plane are:

(i) How can a teacher be helped to quickly identify both the slow learners and the gifted children?

(ii) What procedures, methods and techniques can be followed in helping both kinds of children?

(iii) What assistance can rightfully be expected from a community to discharge this special responsibility?

(iv) What kind of special self-study materials can be provided to the teacher for use by slow and fast learners?

(v) To what extent can mass-media—television and radio—help the teacher in his task? What mechanism of procedures can be evolved for this purpose?

R.N. MEHROTRA

Medium of Instruction: a Case for Modern Indian Languages

R.N. Mehrotra

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Medium of Instruction: a Case for Modern Indian Languages

AN EMINENT INDIAN EDUCATIONIST, WHOM I RESPECT FOR INTEGRITY, sincerity, intelligent grasp of educational problems and concern for our country and its people, recently told me that one was twenty years behind time if one talked of our languages being media of instruction for *all* our children in *all* our schools, colleges, universities, or if one talked of an Indian language becoming the link language (replacing English) for communication among Indians at the higher levels of statecraft, industry, administration and education, not only in the foreseeable future, but ever. I was told that the whole country today wanted English for all these purposes. It is demanded even by poor villagers, slum dwellers, labourers and all classes of the deprived masses of our land, who would like their children to be educated in English just as the children of the privileged classes are.

A young colleague in the university sought advice on which school he should choose for his 3-year-old child. What do I advise? "Educationally, it is sound to send him to a Hindi-medium school, as a child's growth is naturally best in his mother tongue; to a common school where he will socialise with children from different sections of society; to a school in the neighbourhood so that he does not get tired out with bussing long distances for a 'good', 'English medium', 'high-fee' charging school. Such schools usually are municipal schools or government schools while the others are 'public' schools or schools run on 'public school lines' or those which categorise themselves as 'progressive'. All the educational and pedagogical theories I know of , all the mumbo-jumbo I have been spouting to my students and others on education, good education, meaning and aims of education, development of human personality, etc., etc., would lead one to advise that the child be sent to a school of the first type (although I know the advice will not be accepted). But I also hesitate in giving that advice. Will it be fair to the child, his career, his prospects of a good life if he starts with the handicap of schooling which is considered 'poor'? Will he be able to compete with those who go to the other type of school? Specifically, will he suffer from a disability if he studies in a school in which the medium is his mother tongue and not English? Can I with confidence advise the parent to take a risk?"

Is this only because all 'good' schools today are English-medium schools?

Some of us would say, "I want the child to go to a good school—I would surely prefer one with the mother-tongue medium if there was a choice between two equally good schools—one providing instruction through the mother tongue and the other through English."

It is true that all over the country, in cities, in the large and small towns, in semi-rural areas, there is a craze for English-medium 'public' schools. Educationists would say that the parents are being exploited, even fleeced by greedy, clever persons, who open schools with fancy names at street corners, in residential houses, on a verandah of their residence, but parents probably know better. More and more industrial houses, religious trusts and charitable organisations open English-medium schools. Even private educational trusts which were founded as part of a national movement with the avowed objective of promoting Indianness and providing good 'Indian' education through an Indian language—for example, the well-known 'Anglo-vernacular institutions'—take pride in switching to the English-medium, feel no compunction in paying more salary to an English teacher and less to the mother tongue teacher. Factories and industrial complexes run schools for their employees—an English-medium one for the children of officers, and a Hindi or a regional-language medium one for those of the workers. Pressure from the workers then forces the mother tongue medium schools to teach English also.

It is true that 'knowing English' and 'being educated' or being modern are widely considered to be virtually synonymous. The better the English one speaks, the more educated and more modern one is taken to be. Teachers in universities avoid teaching mother tongue sections lest they be considered inferior in scholarship since they do not teach in English. Even our professors of classical and modern Indian languages like to get opportunities to show that they know English well. Our young students make fun of teachers who do not pronounce an English word correctly. Knowledge, thoughts, ideas, understanding, application, thinking and reasoning, analysis, logical presentation—all become secondary, while command over English builds the image. Sending a child to an English-medium school is a status symbol among the upper (and those wanting to join the upper) classes (just like possession of a colour TV or VCR) and therefore they make efforts to attain this status even if it requires donating (bribing with) large sums, flattery, humiliation, seeking recommendations and so on. (What sort of 'character', one may well ask, could such schools build?) Professor A.R. Kamat thus described the situation:

> Such is the demand for this kind of education that in order to book a seat in these schools children (or rather their mothers) are supposed to stand in a queue even while in the womb! This so called public school phenomenon is no longer urban; it has spread to rural areas under the aegis of, for instance, the cooperative sugar factories in Maharashtra and also of the state government itself where leadership of the rural rich has come to power. The newly emerged rural leadership has become fully conscious of the value of the English medium education and are,

therefore, trying their best to use this exclusive channel to keep their date with elitist positions, if not in this generation, at least in the next.[1]

Shall we blame the British for this division of education for 'the classes' and for 'the masses'? Are we to blame them for the system under which a few are educated through the English medium who, in turn, pass on what they have learnt of European knowledge to the masses in the other schools through their, 'dialects'? Even the protagonists of the 'downward filtration theory' would be amazed if they were told that the filtration is making the masses also demand education through English. Even the notorious, much-maligned Macaulay expected this class of people who were Indian in blood and colour only to work for the improvement of their vernaculars.[2]

While clearly discarding the Indian languages as media of instruction, he said:

> All parties seem to be agreed on one point, that the dialects commonly spoken among the natives of this part of India contain neither literary nor scientific information, are moreover so poor and rude that until they are enriched from some other quarter it will not be easy to translate any valuable work into them.

He assigned this task of enriching the vernacular to the Indians educated through English:

> . . . it is impossible for us, with our limited means, to attempt to educate the body of the people. We must at present do our best to form a class who may be interpreters between us and the millions whom we govern—a class of persons Indian in blood and colour but English in tastes in opinions, in morals and in intellect. To that class we may leave it to refine the vernacular dialects of the country to enrich those dialects with terms of science borrowed from the Western nomenclature and to render them by degrees fit vehicles for conveying knowledge to the great mass of the population.

The later British administrators piously hoped that a day would come when the highest knowledge (of course Western knowledge) in this country would be imparted through the Indian languages. Even in their wildest fantasies they did not dream of English being the language of *all* the people of this country.

Am I exaggerating the situation? Haven't we done a lot for the improvement of our languages? Aren't they the media even in our colleges and universities?

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[1] A.R. Kamat: 'Dominance and Dependence in Education and Culture', *Mainstream*, Annual, 1982, p. 63.

[2] H. Sharp: *Selections from Educational Records*, Vol. I, Government of India, 1913, 'Macaulay's Minute', pp. 107-17.

Yes, they are, yes, we have done a lot for the promotion of our languages during the last forty years, but not sufficient. But it seems that this work has reached its limit. The vested interests will not allow it to go further. The situation, as Professor Kamat pointed out cannot be mended, it can only be ended:

> Here English language and the English educated have continued to keep their hold on most of the material (and cultural) interests and all strategic positions in the country over the last three decades of independence. The change in favour of Indian languages which took place because of political democratisation seems to have reached its limits. Further transition although necessary and inevitable for further democratisation and social change in favour of the oppressed and the suppressed will be difficult because it is being blocked by the dominance of English and the English educated. In such a situation Indian languages can come into their own only to the extent that English is removed from its present strategic entrenchment. And this is not in the interests of the English-educated powers that be for what do they gain through the arduous transition it involves? On the other hand, they have so much to lose because that transition will only benefit the people low in the socio-economic hierarchy which will create a challenge to the present power structure.[3]

What then is the future perspective? There cannot be a break except through a complete breaking down of the present structure.

The employment market, the prestigious institutions of higher education and research, the highly prized administrative services, the paying professions of law and medicine, the executive jobs in public and private sector undertakings, in industrial and business administration and management, scientific and industrial research institutions and banks—all place great value on knowledge of English. "English meant Money" said Lord Ellenborough more than a hundred years ago. Therefore one should know English. One would know English better if one got one's education through it. The sequential argument runs like this: higher education through the English medium will be more effective if the student has had secondary education through English and secondary education through English will be easier if he has had his primary education through English, which again will be facilitated if the nursery school medium was English (as if a nursery school should have a language as a medium!). And the child should be helped by the family in English before he goes to school. Therefore teach him the English alphabet and English words from the day he is born. It is pathetic to see (sometimes even half-educated or semiliterate) parents teaching the young baby to say, 'nose', 'ear', 'milk', 'fan' for these things, from the time he learns to babble. And more and more middle class Indian families are becoming English mother-tongued. English swear words are laughed at, while the same abuses in an Indian language are considered vulgar.

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[3] A.R. Kamat: op. cit., p. 69.

Even for the job of a salesman, a peon, a clerk at a ticket counter, a bus conductor, employers want and prefer those who know (even have some smattering of) English. A better-off villager has already become westernised in dress; a village bridegroom gets married in lounge suit with tie in the winter or a 'terycot' safari suit in the scorching heat of summer and lards his conversation with a smattering of English words.

It has been said that English has united India into one nation, that the feeling of nationhood has come because people from different parts of the country can communicate with each other in English. A deeper analysis may show that this is a very superficial conclusion, while it can be easily seen that English has divided the people into two broad categories—the English-knowing classes and the mother-tongue-knowing masses. The masters in a house will talk in English when they do not want their domestic servant to know what they are talking about (it would, however be interesting to find out how much the 'poor non-English knowing' servant has understood!).

The University Education Commission 1948-49 said:

> It is true that the English language has been one of the potent factors in the development of unity in the country. . . .Many advocate the retention of English as an instrument for the continuance and fostering of the unity which it has helped to create. But in addition English has supplied us with the key to the fundamental ideas of modern civilisation, to modern science and philosophy and what is more important for all practical purposes English will continue to be our principal means of maintaining contact with the outside world.
>
> . . . a plunge into an altogether different system seems attended with unusual risks. It appears to us, that the plunge is inevitable. English cannot continue to occupy the place of State language as in the past. *Use of English as such divides the people into two nations.* The few who govern and the many who are governed, the one unable to talk the language of the other and mutually uncomprehending. This is a negation of democracy. [4]

The English-educated are foreigners in their own land. As they have not cared to study their own languages well and as these languages are considered inferior, they do not read poetry, drama, stories, novels writings of the creative writers in their mother tongue. Thus they do not understand the society in which they live. They do not understand the hopes, aspirations, joys, dreams, frustrations, pains, sorrows of their own people. They read novels in English which makes them knowledgeable about American or British or other societies—good in itself, but not when it is at the cost of neglect of their own literature.

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[4] *Report of the University Education Commission,* Vol. I, Ministry of Education, Government of India, 1950.

The privileges and advantages which the upper and middle classes enjoy make them parasitic; "aliens in their own culture through adoption of the values and life styles of a consumption oriented industrial society".[5]

Of course, Indians can learn English well—even Macaulay gave that certificate, which flatters us:[6] "Indeed it is unusual to find, even in the literary circles of the continent, any foreigner who can express himself in English with so much facility and correctness as we find in many Hindoos."[7] Similarly, Colvin's Note of 24 November 1839, after the founding of the Hindoo College, said:

> The consequence has surpassed expectation. A command of the English language and a familiarity with its literature and science have been acquired to an extent rarely equalled by any schools in Europe. Another generation will probably witness a very material alteration in the notions and feelings of the educated classes of the Hindoo Community of Calcutta.

Compare the fluency with which Indian Airlines hostesses make announcements in English with the laboured artificiality with which they do so in Hindi. It seems almost as if English is their mother tongue.

The gulf will continue to widen as long as English is for some and Indian languages for others; that is until all people of a particular region use the same (regional) language for all purposes.

Why and how did we get into the unfortunate situation in which we are today with regard to our languages? For one thing, it has been unfortunate that we have not been able to develop one of our languages as a national language, a language for all-India purposes. The reasons have been mainly political but shortsighted chauvinistic regional pride must also take a substantial part of the blame. A national language gives a nation 'nationhood', a foreign language cannot, as the national psyche will continue to suffer from a sense of inferiority. In world history, when nation-states developed, a nation identified its own language as a national language. In Britain, in the 14th century, men of learning read, wrote and conversed in Latin, the upper classes men of culture did so in French; English was the vulgar tongue of the lower classes. After the Anglo-French Hundred Year War, the language of the 'French dogs' was given up. Italy gave up French after Napoleon proclaimed himself King of Italy in 1805. By the 18th century,

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[5] Jayaprakash Narain: Foreword to *Education for our People, A Policy Frame for the Development of Education* (1978-87), Citizens for Democracy, Allied Publishers, New Delhi, 1978.

[6] 'Macaulay's Minute', in H. Sharp, op. cit., p. 115.

[7] Ibid.

Germany gave up French which was till then the language of the elite, and the Russians gave up German and French. Are we at the same social stage now as existed in those countries then? Is it then a passing post-colonial phase?

Why is it that the educated Indian did not similarly give up the language of the erstwhile rulers after Independence? The possible reasons might be, (1) the way power was transferred, (2) Gandhiji's teaching of 'hate the evil and not the evil doer', (3) the vested interest of the educated in maintaining English, (4) difficulties in accepting only one national language (Hindi) and developing it, (5) concern for linguistic minorities (a unique feature of our constitution), (6) our sense of inferiority and our low opinion of our own languages, (7) narrow linguistic loyalties resulting in mistrust (e.g., C. Rajagopalachari pressed for a speedy replacement of English as the medium of instruction in universities; but in 1959, pleaded that there should be no change).

In 1911, Gokhale had observed that the educated people of this country would be on their trial when freedom was won. The educated classes have been found wanting as they have neither done sufficient work for the promotion of modern Indian languages nor for removal of English after attaining Independence. The downward filtration theory was falsified and so the masses now demand English-medium instruction.

R.K. Yadav in his study of Indian language problems brings out the wider implications of change in media of educational instruction:

> A medium of instruction is not like a mechanical spare part, merely to lay hands on to replace the old one, in course of time, the established language gets so intimately mixed up with the whole educational structure of the country that a change in the medium of instruction at the universities affects the school curriculum, the administrative machinery and even aspects of national life not directly involved.[8].

The medium of instruction should be such as to enable students to acquire knowledge with facility, to express themselves with clarity, and to think with precision and vigour. From this point of view, the claim of the mother tongue is undisputable.

Many committees and commissions and political parties, before and after Independence, have made recommendations about the medium of instruction at various stages of education. There has been unanimity about the mother tongue (which for most children in a state will be the regional language) being the medium in primary classes. This was so all through the period of British rule too. For secondary and middle (or junior secondary) education also, it was generally agreed that the regional language should be the medium. In the days of British rule, the teaching of English as a subject could start in the upper-primary or middle school classes. But even in those days, it was not recommended as the medium of instruction.

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[8] R.K. Yadav: *The Indian Language Problem, A Comparative Study,* National Publishing House, Delhi, 1966.

For secondary and senior secondary classes, except for some subjects like science, regional languages have been recommended. In the period up to 1921, English was used as a medium for secondary classes. But during the period of dyarchy, 1921-37, this this was changed. Indian languages were the media of instruction in most schools by 1937. Thus in 1947, independent India began with regional languages being, by and large, the media of instruction in secondary schools.

The question of the medium for higher education has, however, been beset with controversy. The issues were: (1) should Hindi replace English, or (2) should the regional languages be the medium, or (3) should English continue. It was hoped that, ultimately, Hindi would become the language of higher education all over the country, but that it would be premature to expect it to do so immediately. English would not continue for long—only as long as we required to prepare books, literature, etc. in our languages. It would be retained temporarily, but gradually regional languages should substitute it. In most Indian universities and colleges today, regional languages are used alone with English for undergraduate education. Only in some places are they used for postgraduate education and research.

However, despite the near unanimity on the desirability of using the mother tongue as the medium of instruction, there is a feeling current among academics that those educated through a regional language are inferior to those educated through English. This appears to be so because of our prejudices in favour of English, but this could also be a fact. The reason could be that the children of the privileged classes who have more facilities, which they have had through generations, have studied in 'good' schools which teach through English while the first generation learners, the children of the poor, have had a 'poor' education in municipal schools, from indifferent teachers, with no motivation. Yet one often comes across great depth of understanding among poor Indian-language-educated university students as compared to the superficiality of many of the English-educated ones. Compare this sense of inferiority with which we suffer with what Sir Harcourt Butler, the Member In-charge of Education, said in a debate in the Imperial Legislative Council on 17 March 1915 (on a resolution by Mr. S. Rayaningar asking for Indian vernaculars as media in secondary schools):

> I can only tell you that in my own experience and in the experience of many competent educationists with whom I have discussed the question there is markedly greater intelligence in the boy whose education has been conducted through the medium of the vernacular until the higher classes of the school are reached than the boy who has had his education conducted in English in what used to be called in some provinces the upper middle school.

That was also the conclusion which the Education Commission of 1882 came to in regard to Bengal.

In spite of these sound recommendations and decisions, why are we today in a situation where the English medium takes pride of place?

Some reasons are well known: the value of knowledge of English for securing jobs; the belief that knowledge of English is the key to modernisation, 'high tech', etc.; the notion that our prestige among comity of nations will be high if our representatives speak in beautiful English; lack of confidence in the richness of our languages; lack of political will. "Hindi vocabulary is not rich enough", Mrs Gandhi said at the 3rd Hindi Viswa Sammelan, 1984. "The standard of English is falling", worried Mrs Gandhi.

Are we being merely sentimental (on patriotic grounds) and therefore narrow in not wanting English as a medium. It may be noted that it is nobody's case that English should be thrown out of the country. It should be learnt as a subject; the objection is to its being the medium of instruction and thus gaining the importance it has. As the Citizens for Democracy policy frame, *Education for Our People,* put it:

> English will have to be delinked from status and privileges and it will have to play an enabling role of providing an individual access to world knowledge. This is a service function where the emphasis will be on enabling an individual to acquire as much of English as he needs at any time in his life and not on discriminating in favour of those who know English and against those who do not.

What is the harm in keeping English as the medium of education from the lowest class (pre-school!) onwards? What ill effects will this have both for the individual and for society?

Learning through a language which a pupil does not know well, blocks knowing, understanding, thinking, analysing and evaluating what one observes and what one is taught. A student should know a language well before it is used as a medium of instruction. The child knows his mother tongue for 5/6 years before he begins formal schooling in a primary school. He has learnt to name things, ideas, persons, relationships in the mother tongue. Therefore, it would help further learnings if it is undertaken in that language.

The Hindustan Times, Delhi, in its Editorial of 11 February 1979 wrote that the

> underprivileged are those who are fortunately really privileged, being educated in mother tongue, beneficiary of the harmony of sound structures he has inherited and those he has to learn. The English-educated urban elite has persuaded itself that this harmony is not important.

It is an accepted fact that a foreign language cannot be learnt until one has had a fair command over one's mother tongue. Having faith in this idea, in the British days, in no province was English, as a subject, started before class III—in most cases it started at class VI. Its use as a medium of instruction began only after it had been taught for three years as a subject (class VI or IX). It was never suggested as a medium from the lowest primary class.

The Report of the study group appointed by the Ministry of Education, Government of India, in 1964 states:

> The group has also expressed the view that the policy recently adopted by several states of introducing the study of English in class III is educationally unsound. We agree with this view. We believe that an adequate command over the mother tongue should be acquired before the learning of a foreign language like English is begun.

So if even the teaching of English as a subject should not start before class III, there is no question of its use as a medium. It has been found again and again that, to acquire an adequate command over English becomes the foremost concern of the students at the cost of attention to good understanding of subject matter. The 1919 Calcutta University Commission found that an Indian student devoted a third of his time to learning English. The Panjab University Inquiry Committee (1933) also found that a third of a student's time went in obtaining a mastery of English.It has equally been the experience of decades that in schools also, when the medium was English, a large amount of time, sometimes a third of the total school time is spent on learning English. Also other subjects were learnt mainly to learn English. In fact, the subjects became the media of learning English, which became synonymous with education.

Criticising university education in India, Tagore once asked "Of what use are the lights in a railway train to the masses in the villages, when it speeds through the countryside at night?"

Learning through a language which is different from the language one uses in one's daily life results in knowing only 'words', not ideas. As a consequence, education degenerates into cramming. Consequently, minds do not develop, producing mere imitators, not innovators. It also leads to alienation from one's own people.

Education through English has encouraged a kind of opportunism, with no desire to give any unselfish service back to the community. It makes a student extremely selfish and conscious of his rights and privileges but not of his obligations to society. He lacks identification with the interests of his country; professionals do not understand its problems. It is an irony that a doctor in a small town flourishing on his medical practice among the lower middle class families, explains to the illiterate village patients in a language in which the most crucial words are English.

Education for Our People describes the current situation:

> The children from poor families generally get an unfair deal in the system whose entire ethos is oriented to the needs and aspirations of the upper and middle classes and which still continues to use English as the medium of instruction in higher education and thereby encourages the use of English as a medium at the school stage also.
>
> Mediocre and third-rate children of the upper and middle classes find easy

> access to the system especially in urban areas, and even the talented children of the poor who are a national asset often remain outside the system.[9]

On 4 April 1963 Jawaharlal Nehru said in Parliament: .

> We know before Independence what the position was in this country of castes, most hardened caste was the caste of the English-knowing people—English clothed, English loving, who were administrators and others. Many of us too belonged to that caste. It was a bad thing because it put a tremendous barrier between us and the people of India.

If the medium of education at the secondary school level is different from the one at the elementary, the learner gets bogged down in learning the language, rather than learning the subject matter. The same happens, with greater damage, when the medium is changed for higher studies. The understanding of the complexities of higher education becomes more difficult when coupled with efforts to make up for deficiency in the language used in the class. It must be understood that knowing a language well enough to use it as a library language is different from being able to respond to it adequately when receiving instruction through it.

Having a single language as medium of instruction throughout one's educational career is a great advantage. This, logically, must be the language with which one has begun one's education, which as has been argued must be the mother tongue. Thus this language which one uses at home and in society should be the language for one's education at all levels.

A very unfortunate result of using different languages at different stages for different purposes is that our students are poor in expression in any language, whether mother tongue or English.

One may here mention a special issue with regard to mother tongue and regional language. For most children in a particular state (particularly after the states were organised on a linguistic basis), the mother tongue will be the regional language. But there are pockets of linguistic minorities in all states. (Recognition of minorities on a linguistic basis is a unique feature of our constitution).

Z.H. Lari pleaded in the Constituent Assembly for primary education through mother tongue as a fundamental right. "Will it be possible" he asked, "for the minority to demand that in those institutions which are being established by the state which makes free elementary education compulsory elementary education be imparted through the medium of the mother tongue?" The amendment suggested by him read: "Any section of the citizens residing in the territory of India or any part thereof having a distinct language and script shall be entitled to have primary education imparted to its children through the medium of that language and script." This was negatived because our leaders were not ready to make primary education a fundamental right.[10]

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[9] *Education for Our People,* op. cit., p. 60.

The University Education Commission (1948) had this to say on the issue:

> *Pockets of Minorities.* The policy that the language of the region should be the medium of education at all stages in the region has certain obvious limitations. There are in India a number of provinces which contain pockets of inhabitants speaking a language different from the regional language. In such cases the right policy is to allow unreservedly the use of the mother tongue for basic education and if the numbers are adequate for secondary education also, introducing the regional language gradually in the upper grades at the school as the child grows older and making it the medium of instruction at the university stage. [p. 323].

The Indian Education Commission (1966) was of the opinion that, at the primary stage, the medium should be the regional language which would also be the mother tongue of the vast majority of children. For linguistic minorities it could be either their mother tongue or the regional language, according to their choice:

> The state governments should therefore, provide primary schools teaching through the mother tongue for the children of linguistic minorities if they desire to have such an education, subject to the usual condition approved by the Education Ministers' Conference (1949) that the minimum number of such children should be 10 in a class or 40 in a school.

It is, however, in their interest that they switch over to the regional language as soon as possible after the primary stage. Firstly they should be learning the regional language as a subject in the upper primary classes. Then the regional language is the language which they hear used (and they themselves use outside their home) around them in the community they live in, the bazaar, the entertainment places, the friends and so on.

* * * * * *

Language learning is not always an outcome of the number of years or amount of time given to it. It is much more a matter of motivation. Young persons learn the native language soon when they go to foreign countries for jobs or higher studies or practical training. The motivation for one's regional language will be enhanced once the language is used for all purposes—administrative, legislative, business, commerce, industry, education. With career openings where the language is valued, with appreciation of one's proficiency in one's mother tongue at a premium, with respect for it increased, its learning and learning through it will be enriched. This will bridge the gulf between the educated, the non-educated, the merely literate and the illiterate, the privileged few and the deprived many. This will make the lives of the educated relevant and meaningful and will improve the conditions of those who have not been able to go beyond a primary school.

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[10] *Constituent Assembly Debates,* Vol. IX, 7/8 December 1948.

Finally, it may be validly argued that the medium of instruction in schools is a non-issue as, statistically, a very large majority of our elementary and secondary schools teach through the medium of an Indian language. Also the proliferation of English-medium 'public schools' all over the country is no evidence of a demand for the English medium by our people. However, it has to be accepted that this phenomenon does demonstrate the popularity of the English medium among the class of people next to the top, or the traditional elite. Also, this does indicate a trend. It could be that, gradually, the less privileged strata of society will clamour for the English medium as this may help fulfil their hopes of getting good jobs for their children.

Knowing our elite, I have a feeling that this process will go a full cycle and that, by the time the masses start hankering after and get English-medium education for their children, the Hindi or the mother-tongue medium will have become the in thing, the status symbol and the open sesame for privileges, and consequently the masses will again be beaten and left behind. If we are interested in the creation of an egalitarian, democratic society, with a humane quality of life for all, the medium of instruction should be considered an important issue and the language of the people should be the only language in which instruction is given to *all* our children.

There are some indicators that justify the apprehension that English might be accepted as a subject (and even as a medium) even at the primary stage. A training programme for primary teachers in one state includes two languages—English and the regional language or Hindi. Thus, for primary teachers English is considered more important than either the regional language or Hindi, as English is compulsory. Any new private school opened anywhere in the country today is likely to be an English-medium one. In the class X (public) examination conducted by boards in most states today, the students appear in two languages, one of them, by and large, is English. So the issue of medium of instruction at all stages is not a non-issue.

The main question is: Do we consider our language sufficiently developed to serve as medium of instruction at all levels? During a debate in the Constituent Assembly, Professor K.T. Shah said, on 7 December 1948:

> Speaking of the languages of the various sections of the country, they have in recent years, especially during the last two or three generations, developed and cultivated up to a point at which many of them have become suitable, in my judgement, to become the vehicles for the imparting of any stage of instruction, right upto the university standard.

Can we not say the same with more confidence some forty years after the statement was made.

Can the State force a particular medium on all institutions? The answer is that, possibly, some institutions will get out of it in the name of the protection of minorities. But such minority institutions may become suspect and unpopular if individual interests are not served by the medium that they use. Secondly, they will not like to be out of the mainstream of the society. The National Policy Statement of 1979 was very clear in this regard.

Some schools, notably 'public schools', remain outside the system of public education. They should be brought under the purview of the laws and regulation that govern the system of public education, especially those relating to fees and content of courses. They must have regional language as the medium of education and rules of admission. These institutions should be integrated with the common school system of education with its neighbourhood plan. However, it has to be ensured that the Policy Statement does not remain only a statement of pious wishes, but is sincerely implemented. Essentially, now, it is a question of political will and sound academic commitment.

The real danger, however, arises not from the job-value of English, but from the fact that some of those who matter in academic and government circles may sincerely and genuinely believe that the high-technology communication media and computerisation can be brought into our lives only through English as did Rammohun Roy a century ago. The anglicists of the early 19th century, both among Britishers and educated Indians, argued for English as medium then on the ground that our languages, being poor and rude, were not the apt vehicle for European science and thought and it was only through English that we could come out of darkness, superstition and ignorance. Those keen on not letting India miss the computer age may be really quite convinced that it would be possible to usher in the computer age and lead India into the 21st century only through English medium. It is the duty of the intellectuals and the large number of our people who love and believe in the adequacy of their language and its rich literature to clearly advocate that our languages have the genius to convey the highest technological concepts. Further, it should be emphasised that unless we get all this high technology etc. through our languages, we will always remain only imitators and followers and will never be able to innovate and conduct really original research in the fields of science and technology. The Japanese example is a guide. The Japanese decided about a hundred years ago to bring modern (western) science to their people through their own language. The results are there for the whole world to see and admire.

However, if we do not give that much credit to our languages, we are fighting for a lost cause.

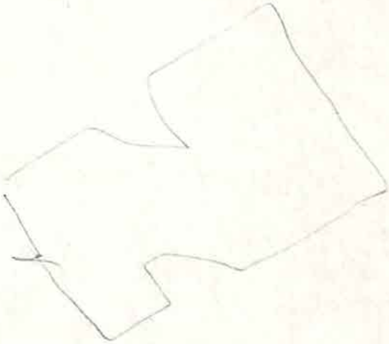
I conclude by quoting Gandhiji on this issue:

> English having been made the medium of instruction in all higher branches of learning has created a permanent bar between the highly educated few and the uneducated many. It has prevented knowledge percolating to the masses. The excessive importance given to English has cast upon the educated class a burden which has maimed them mentally

> for life and made them strangers in their own land.

Further,

> But I would not have a single Indian forget, neglect or be ashamed of his mother tongue or feel that he or she cannot think or express the best thoughts in his or her own vernacular.



M.M. CHAUDHRI

Educational Media and Technology

M.M. Chaudhri

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Educational Media and Technology

SEVERAL DOCUMENTS IN INDIA[1] ON EDUCATIONAL TECHNOLOGY HAVE spelt out the definition and scope of this new and rapidly emerging area. However, the documents in a general way suffer from two limitations. They either relate educational technology to the hardware, the machines or to the mass media or use the definitions in isolation without linking them with the educational issues of the society or the country. Consequently, discussion on the planning of educational technology in India has been limited in scope and narrow in vision. This paper makes an attempt to present a perspective of educational technology in the context of Indian education for the next decade or so.

The often repeated aphorism, 'science is universal but technology is specific', is fully applicable to educational technology. Even though some of the basic definitions and concepts in this field may be universal, for India, educational technology would have to be *applicable* to the Indian education scene—rural and urban; to the education of the culturally rich and the culturally poor, to the sophisticated and the unsophisticated. Hence analysis of this subject requires:

1. An adequate understanding of the concept of educational technology as currently formulated. (What form of educational technology is needed in a culturally diverse and linguistically varied India.)
2. Analysis of the educational media in the context of Indian experience at training, production, dissemination and access.
3. An assessment of future needs and planning.

Concept of educational technology

The term, 'educational technology' (ET) came into vogue during the 1970s in our country. It was defined and understood in different ways by different schools of thought. At first it was understood (or misunderstood) to mean the sophisticated machines which had proliferated, such as television, audio and video tape recorders and computers. This led people to think that ET was just the new jargon for audio-visual aids. Some experts, on the other hand, used words such as systems analysis, media taxonomy, hardware, software and a host of other terms used in technology and management.

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[1] UNDP Project Document on Centre of Educational Technology, India, 1973; Report on Educational Technology, CET Workshop at Mysore, 1976; Report of the Working Group on Educational Technology, Ministry of Education and Social Welfare, 1978.

At this point it may be worth looking at the definitions of 'education' and 'technology' in the Oxford Universal Dictionary, where *education* is explained as

— the process of learning, growing up;
— the process of rearing or bringing up; and
— systematic instruction.

In other words education is concerned with teaching, learning and providing systematic instruction for the growth of an individual.

Technology is defined as

— systematic treatment;
— scientific study of practical arts; and
— the process of development of materials.

What is common to both is 'process' and 'systematic treatment'. In one case it applies to education and in the other case to materials. System, a word now commonly used in medicine and technology, means, in general terms, a complex whole where a set of connected things or parts are arranged to work together. The human body is a system in which several sub-systems (respiratory, digestive, nervous, circulatory) or parts work together.

Some of the definitions of ET[2] have been accepted and widely quoted. They are worth recalling at this stage. For example, the US National Council on Educational Technology in 1971 described it as follows:

> It is characterised by four features in particular; the definition of objectives to be achieved by the learner, the applications of principles of learning to the analysis and structuring of the subject-matter to be learned, the selection and use of appropriate media for presenting the material, and the use of appropriate methods of assessing student performance to evaluate the effectiveness of the courses and materials.

It also says that:

> Instructional technology is more than the sum of its parts. It is a systematic way of designing, carrying out and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communication and employing a combination of human and non-human resources to bring about more effective instruction. The widespread acceptance and application of this definition belongs to the future.

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[2] J.W. Armsey and Norman C. Dahl, 'An enquiry into the uses of Instructional Technology', A Report, Ford Foundation, 1972.

The statement that "the application of this definition belongs to the future" is significant.

In spite of these statements, the prevalent view on educational technology is hardware-oriented, laying heavy emphasis on mass media. This is not only so in India but also in many other developing countries. The 'hardware' and 'mass media' conception (or misconception) has very often resulted in projects requiring enormous funds to buy or import sophisticated equipment in a mostly 'one shot' affair, without caring for the other elements of educational technology—that of employing a full range of learning resources and organisation and management of the processes involved. In the din of technology, quite often, education gets left behind.[3]

The essence of educational technology obviously is not simply machines but much more than that.

> It is a way of organising, really—a way of thinking about materials, men, organisations, patterns, man-machine systems. It applies tests of economic feasibility to the problem. And it is fundamentally concerned with the interaction of science, art and human values.[4]

In a sense, educational technology has existed for centuries without being so termed. It was born when someone somewhere first raised the question of teaching-learning objectives and means and methods by which they might be achieved. These methods might have been purely aural or with only a book and a blackboard. Nevertheless, this person was talking about educational technology.

Today Bo Erikson's[5] description of the field is one of the most comprehensive visions of educational technology.

> There are two important fields of applied education . . . One of these fields involves over-all social planning, and is concerned essentially with the qualitative and quantitative design of a community's entire education system . . . the educational planning. The other is instructional technology. It is in this context that planning of instruction and arrangement of learning situations take place . . . (with translation of) social goals, principles . . . developed by the Educational Planner . . . into changes in the learning behaviour of individuals. The purpose and functions of these two fields join together to make up 'educational technology'.

Erikson's description leads us to the conclusion that educational technology is concerned with each and every aspect of education. One might say that this description includes work in the fields of

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[3] Report of the Task Force on Mass Communication and Educational Technology, University Grants Commission, New Delhi, 1983.

[4] P.D. Mitchel, 'Educational Technology', *Encyclopaedia of Educational Media, Communications and Technology*, McMillan, 1977.

[5] Ibid.

- the psychology of learning,
- audio and visual methods of presentation,
- educational planning and organisation,
- curriculum development and course design,
- production of teaching and learning materials,
- storage, retrieval and dissemination of information,
- allocation of resources,
- cost and effectiveness of media in education, and
- problems of innovation.

Educational technology may be applied to all levels of educational practice as an approach to solving practical problems.

P.D. Mitchel[6] takes the multifaceted concept of educational technology and breaks it up into five fundamental aspects. Although each of the five may stand alone, they fuse together to represent the core meaning of educational technology. This concept needs elaboration.

1. *Educational technology I: educational psychotechnology*
This is concerned with enhancing a student's capability by manipulating sensory input directly or symbolically, by verbal or audio-visual communication. The focal point is enabling the student to achieve the behavioural objectives.

2. *Educational technology II: educational information and communication technology*
This relates to the design (curriculum), production and evaluation of instructional materials and communications for dissemination locally or at a distance. Thus information for education is generated, selected, processed and stored so that knowledge is made available where required.

3. *Educational technology III: educational management technology*
The third aspect of educational technology focuses upon management of educational resources. It is related to the problem-solving process whereby resources, including the orginsation itself, are allocated to produce desired educational results. Involved in resource management are issues such as planning, budgeting and operations research.

4. *Educational technology IV: educational system technology*
The essential aspects of this form of educational technology is educational system engineering: the planning, design, construction and evaluation of total education system. Here the concern is with administrative systems, operating systems (a department or an institution, correspondence course, radio or TV series) or alternatives to achieve a set of goals.

5. *Educational technology V: educational planning technology*

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[6] Ibid.

Educational planning (at a super-institutional or national level) is the final sphere of activity which defines educational technology. The Kothari Commission[7] set out to describe such planning in the 1960s for India and the National Education Policy, 1986, is working out the planning currently.[8] Where does this review from literature, brief as it may be, lead us? Perhaps nowhere, if we use these definitions and concepts in isolation and do not evolve our own framework of educational technology in the Indian context.

India is a vast country with an enormous diversity of culture, environment and language. A uniform pattern of education can be conceived at best at the higher levels of education. At literacy, primary, and elementary levels, the educational objectives and design would have to depend on the state or regional needs of the people and their occupations. The educational objective should not be to destroy their culture or urbanise them but to preserve and enrich their heritage with new ideas and scientific methods. Therefore, educational technology in India would have to have a concept which will cater to the educational needs of the country at the micro, mezo and macro levels—the district, state and national levels simultaneously. One can make an attempt to look at educational technology from the point of view of the following sub-systems:

1. Identification and aspirations of the community from the point of view of social, cultural, economic and linguistic needs. System design for *audience profile technology.*
2. Development of learning objectives at different levels of education (pre-primary, primary, elementary, etc.)—*psycho-social technology.*
3. Development of curriculum with interaction of language, science, art and human values—*curriculum technology.*
4. Organisation of learning resources—the environmental school, library, museum—what can be developed, stored, and used with cost effectiveness—*learning resources technology.*
5. Organisation of training programme (pre- and in-service) for continued education of the teachers—*teacher training technology.*
6. Development of instructional material (books, guides, AV aids) for direct and distant learning—*educational media technology.*
7. Development of formative and summative evaluation tools—*evaluation technology.*
8. Development of the framework and detailed requirements of schools, personnel, space, training, budget and time-frame—*educational management technology.*

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[7] Report of the Education Commission (1964-66), Education and National Development, Ministry of Education, Govt. of India, 1966.

[8] *National Policy on Education—1986,* Ministry of Human Resource Development (Dept. of Education), Publication Number 1539, May 1986, New Delhi.

9. Total philosophy and planning of the educational system at district, state or national levels—*educational planning technology*.

In suggesting the nine sub-systems of ET, the idea is to show that, whether one is developing the curriculum or planning media or designing a teacher training programme, there is a systematic and scientific way to plan and implement it for long-term effectiveness.

Examples of the educational technology of (1) production of science equipment[9]; (2) development of material on adult education[10]; and (3) distance education with television[11] have been shown in figures 1, 2 and 3. These though not comprehensive, would give an idea of dimensions of systematic planning and preparation required towards each of the three tasks.

Unfortunately, quite often the approach in educational technology has been to import machines and expect them to work miracles without planning the software and manpower. In the 1950s the 'dream machine' was the filmstrip projector; in the 1960s it was films; in the 1970s it was audio-visuals or slide-tape; and now in the 1980s the scene is that of video. Even taking the narrow definition of ET as confined to educational media and broadcasting, is it possible that one can look at them and plan systematically?

Educational media

Media in education as seen by the above analysis, is not educational technology. In a country where one is dealing with enormously large numbers—two-thirds of the population is illiterate, 60 per cent of the children drop out etc.—it becomes important not only to consider improvement in quality of teachers but also the reach of education. Simple direct learning materials are important where student-teacher interaction takes place; and broadcasting through radio and television assumes significance as a technology to apply in the most difficult conditions.

The Educational Media (EM) can broadly be classified into—

1. *Non machine devices* (e.g. charts, maps, globes, cutouts, flashcards, models, toys, puzzles and games).
2. *Machine-operated devices* (e.g. filmstrip, slides, OHP transparencies, audio and video cassettes, films).
3. *Broadcasting*— radio and television.

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[9] *New Trends in the Utilisation of Educational Technology for Science Education*, Unesco.

[10] M.M. Chaudhri, 'Educational Technology and System Design for the Production of Educational Material for Adult Education Programme', *Indian Journal of Adult Education*, Vol 41, No. 182, 1980.

[11] M.M. Chaudhri, Reaching the Rural Children of India with Educational Technology—From SITE to INSAT, International Conference on Distance Education, Melbourne, 1985.

FIGURE 1 SYSTEM DESIGN FOR PRODUCTION OF SCIENCE EQUIPMENT

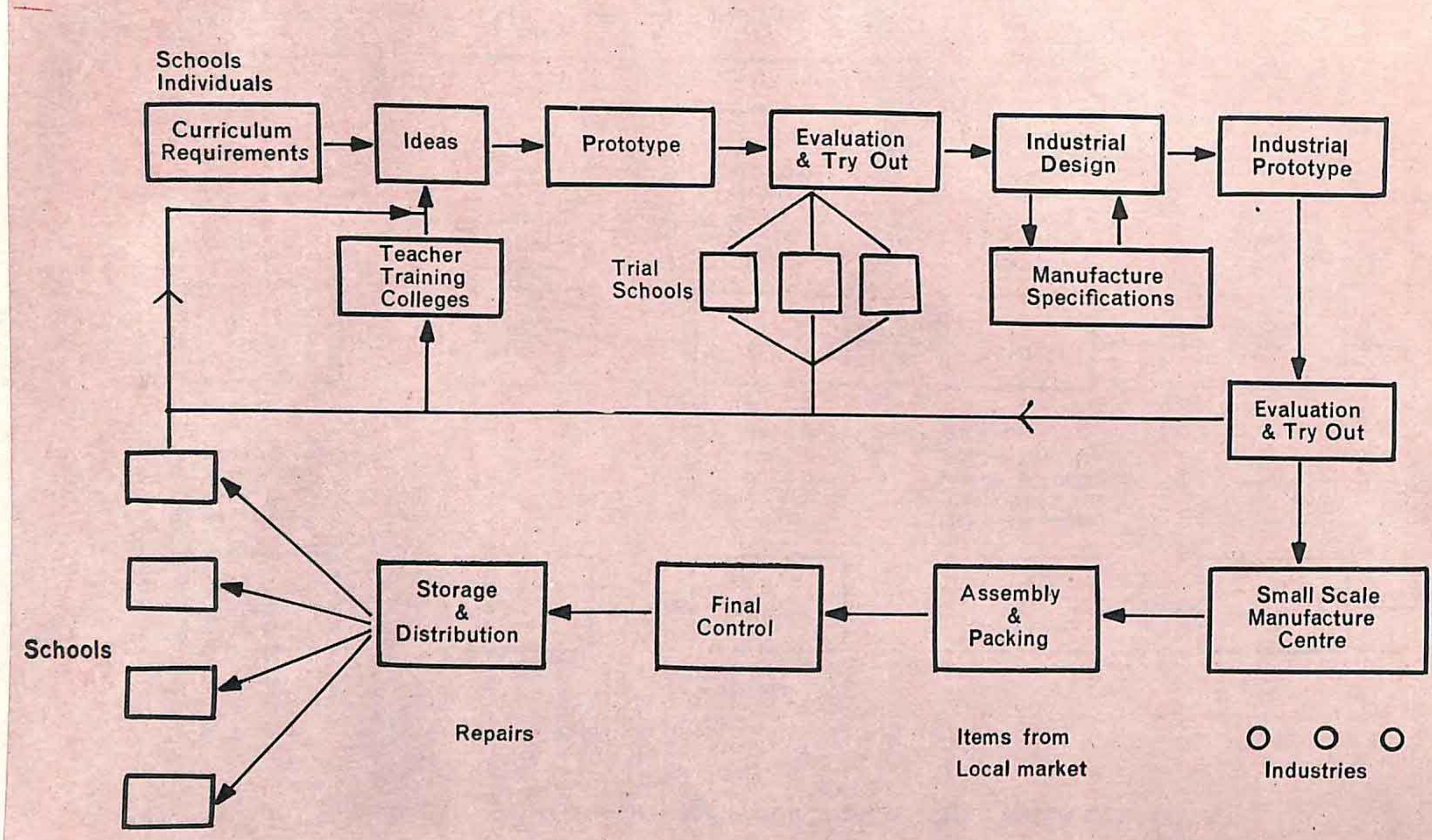
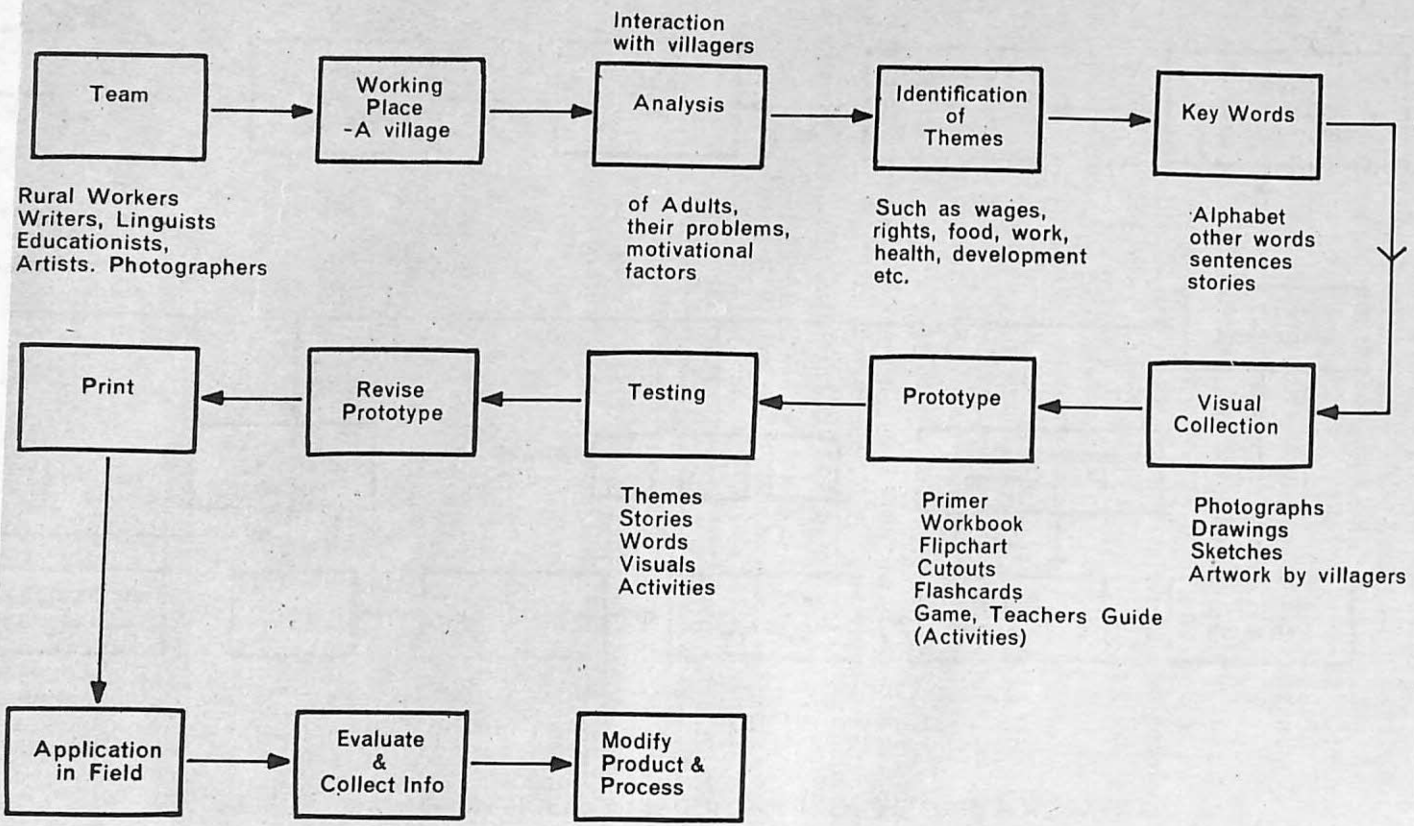


FIGURE 2 SYSTEM DESIGN FOR PRODUCTION OF ADULT EDUCATION MATERIAL



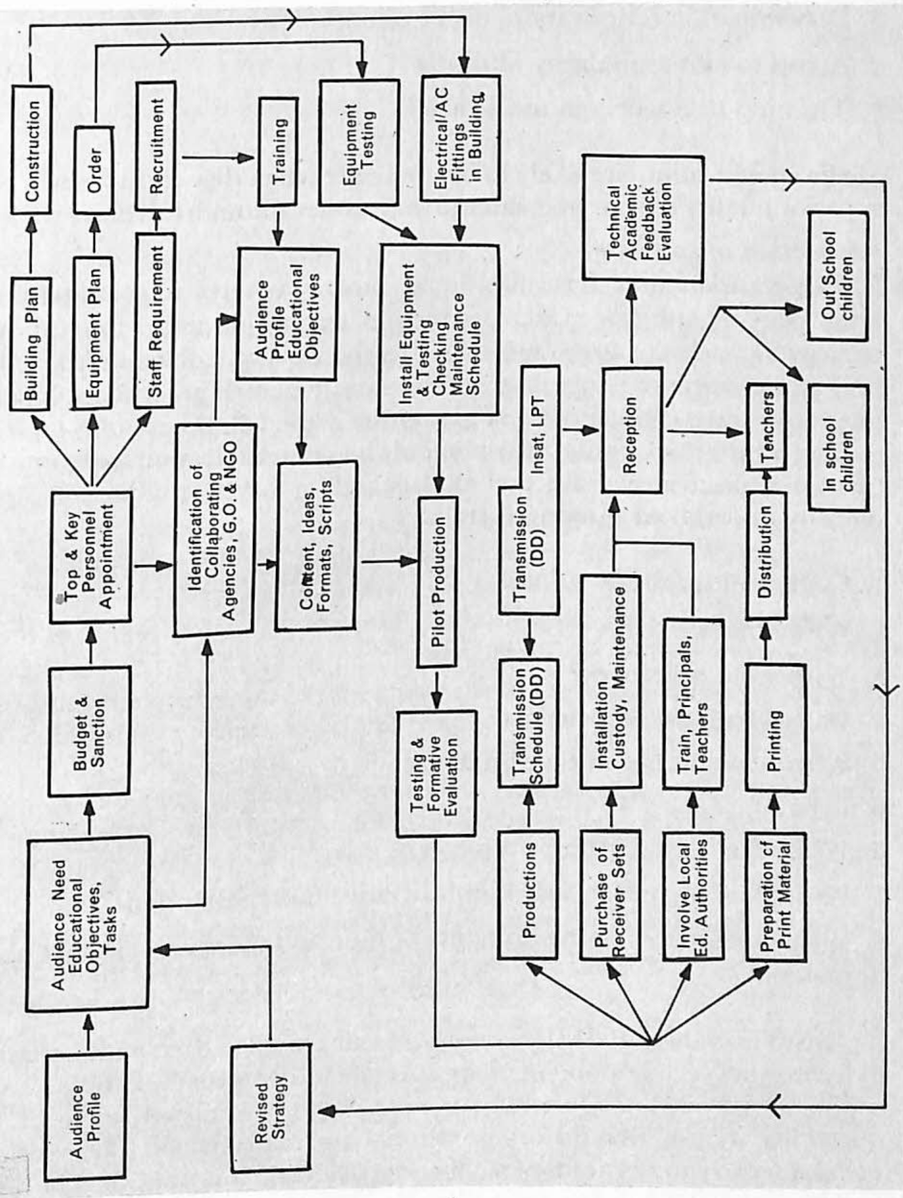

Audience Profile
Audience Need Educational Objectives, Tasks
Budget & Sanction
Top & Key Personnel Appointment
Building Plan
Construction
Equipment Plan
Order
Staff Requirement
Recruitment
Identification of Collaborating Agencies, G.O. & NGO
Training
Audience Profile Educational Objectives
Content, Ideas, Formats, Scripts
Equipment Testing
Electrical/AC Fittings in Building
Install Equipment & Testing Checking Maintenance Schedule
Pilot Production
Testing & Formative Evaluation
Revised Strategy
Productions
Transmission Schedule (DD)
Transmission (DD)
Insat, LPT
Purchase of Receiver Sets
Installation Custody, Maintenance
Involve Local Ed. Authorities
Train, Principals, Teachers
Preparation of Print Material
Printing
Distribution
Teachers
Reception
Technical Academic Feedback Evaluation
Out School children
In school children

FIGURE 3 THE EDUCATIONAL TECHNOLOGY OF DISTANCE EDUCATION THROUGH BROADCASTING FOR RURAL CHILDREN AND TEACHERS

It is important to realise that the major task of teaching at the school level is globally done with the help of teacher, books, blackboard and simple aids. Even to this day, there seems no substitute for them. No machine can replace the role of toys, puzzles and games at the primary and elementary levels.

Educational media have the following basic aspects which need careful planning and developments:

1. The production of software
2. Software production training

3. Dissemination (duplication, distribution, sale and supply)
4. Access to and availability of media
5. Training of teachers in use of media.

Media in education are likely to be used only when they fulfil a need, are of superior quality and are accessible to the learners through teachers or directly.

Production of software

Software production for educational media requires a combination of knowledge of subject, media production techniques and communication strategy to reach the target audience. Merely copying a diagram from a book into a large sheet of paper does not necessarily make a good chart. Nor does just recording a chapter of book give either a good audio or video tape. The media (print or electronic) are only tools for communication and some basic questions need answering and understanding before production can be usefully undertaken. Among them are:

1. Communication for whom?
2. With what needs?
3. With what objectives?
4. With what past experiences?
5. With what means and medium?
6. By whom?
7. With what advance preparation?
8. With what organisational/administrative framework, and
9. What targets are feasible in terms of time and money to produce quality material?

Answers to these and allied questions can provide a deeper understanding of techniques of development of appropriate software for the simple as well as sophisticated media. Quite often, even when we answer some of these questions, we find that the organisational and management framework does not change to suit the needs of media exigencies and innovations. The age-old rules and regulations continue to choke creativity and productivity in the media.

Objectives in communication can be one or more of the following:

1. To entertain
2. To inform
3. To impart skills
4. To present concepts or organised knowledge
5. To correlate knowledge with problems

6. To provoke thinking, arouse curiosity
7. To stimulate imagination and creativity
8. To trigger action towards problem solving
9. To modify attitudes and behaviour
10. To bring about change.

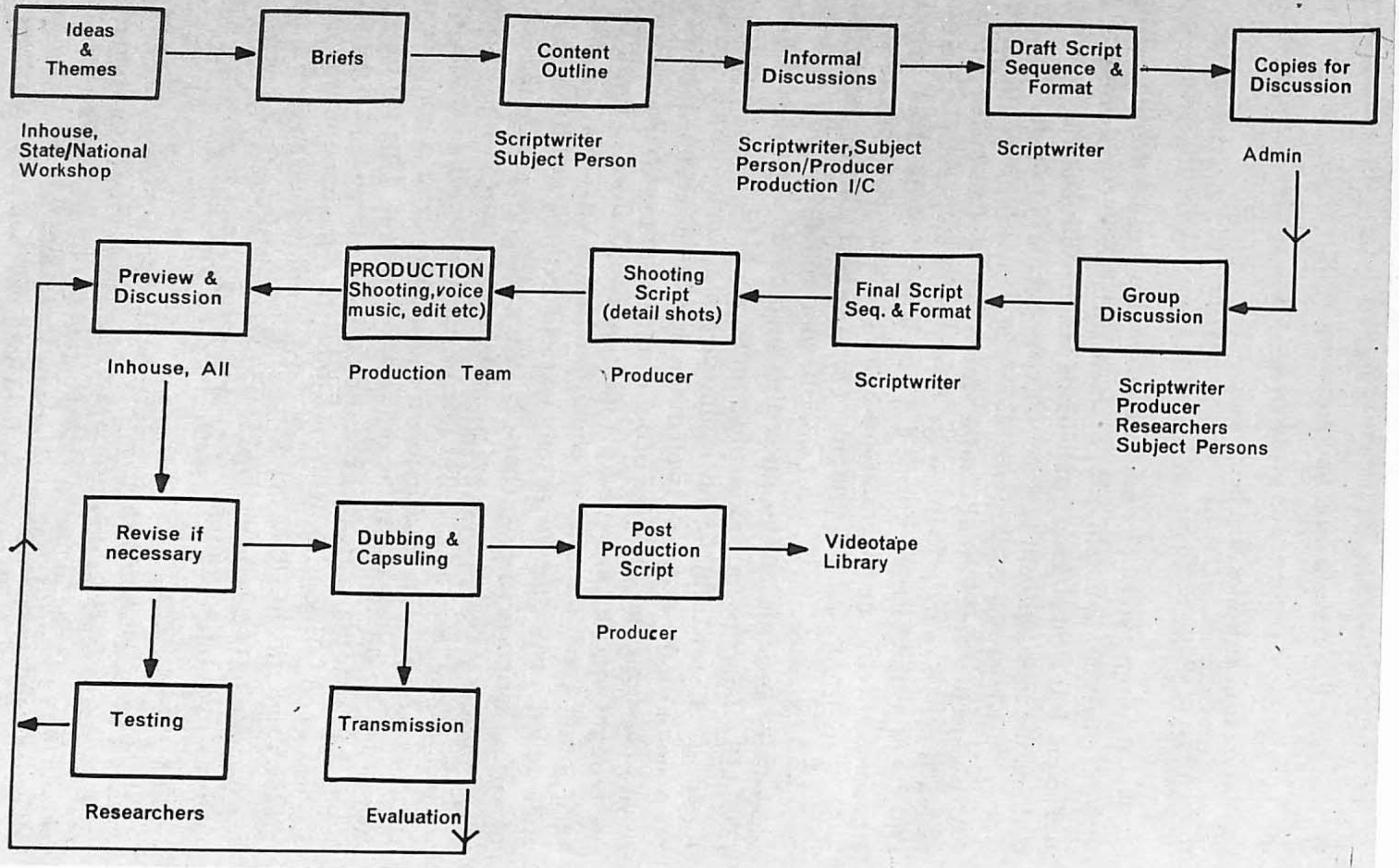
The above hierarchy of communication also implies that it is relatively easier to entertain than to inform, which in turn is easier than to impart skills and so on. It is a much more challenging task to stimulate imagination, and perhaps the most difficult and complex one is to bring about change in the society. Much of our educational system deals with the second, third and fourth objective and virtually stops there. The media objectives ought to extend much beyond the fourth stage in an entertaining and fascinating way. Only over a long period of time can one hope to bring about changes in attitudes. Effective media communication is a long-drawn-out process and needs insight into script development for a target audience and medium.

The script is the basis of all work in educational media. It incorporates ideas to be presented in an interesting manner on a particular medium. Obviously the script for a radio programme would be different from one for television. Scriptwriting for any medium requires a mature understanding of the potential of the medium as well the production stages and processes. Quite often workshops are organised in our country where writers of various kinds are brought together to write for a medium little known to them. Without even seeing good examples of educational materials—charts, audio tapes, slides or video tapes, they, with some textbook lectures, are led into an exercise of writing scripts or making charts or taking photographs. At the end of ten days, volumes of charts, photographs and scripts prepared without asking any of the questions listed on page 230. Seldom does this material measure up to the standard required. The quality of an educational script is not to be judged merely by the correctness of its information content. That is necessary but more than that the method of presentation, use of visuals and words, their sequence and relationship with each other is of paramount importance. A good script normally emerges after lot of questioning and reviewing amongst teachers, subject experts and three or four draft revisions. One such method to evolve scripts for educational television programmes is shown in the flow chart given in figure 4.

Software production training

A sad misconception prevails at various levels that educational media production can be done by artists, photographers, cameramen, sound recordists and now by those who can shoot and edit on video 'wonder' machines. Artists were supposed to make good charts and cameramen good educational pictures all by themselves. Others think that putting a video camera in front of a good teacher would necessarily result in a good TV programme. This kind of unprofessional view prevails because the task of

FIGURE 4 FLOW CHART SHOWING STAGES OF SCRIPT PRODUCTION IN THE INSAT PROJECT



communication through media is seen in separate boxes of disciplines whereas good media communication requires an inter-disciplinary approach and a team effort directed by a person who knows and understands all the elements of production. Satyajit Ray's movies and video productions are masterpieces because he knows all the elements of his craft inside-out. In addition, he has a sensitivity to details of human behaviour which enables him to weave them into a story artistically. In India, there are not many educational media producers/directors whose education, training, experience and interest would extend from the subject matter to graphics, photography, sound, theatre, dance, music, film and literature. This void can be filled provided bright young men and women, now getting attracted towards advertising, are induced to take up work on the educational media and trained appropriately. This can be done only if the field offers job opportunities comparable to those offered by advertising and the universities provide courses on educational communication and technology, giving enough opportunity and time for practicals and project work. The courses could have a combination of essential elements of the courses at the National Institute of Design, National School of Drama, and Mass Communication Research Centre at Jamia Millia Islamia. Furthermore, training in software production needs to be imparted by those having experience of media production as well as by educationists. With the expanding media, it would be necessary to organise two-year postgraduate courses, one-year diploma courses, and short-term specialised courses. In video many of the courses could even be given with 1/2" technology, just as it is possible to teach fundamentals of good photography with a box or Hot Shot camera.

Dissemination (duplication, distribution and broadcasting)
Till the manpower and facilities develop, quality educational media software will not develop and till that develops, there is little possibility of productions reaching the vast body of students or teachers. Because of diversity of language and culture, software generated centrally cannot always be meaningful for all parts of the country. If it has written text as in charts or slides, or spoken words as in A-V or audio cassettes, the language of the region has to be incorporated in it. Dubbing on video or film, if the programme is commentary based, is possible. If it has dialogue, then dubbing is difficult and poses problems in effective communication. Therefore, production centres for educational media have to be created at state and regional levels. Only then will dissemination on a large scale be possible. At present the country does not have adequate facilities for quality duplication of slides, OHP transparencies, and audio and video cassettes at reasonable rates. Once these facilities, already available in photography and films, are available in other areas, production can be stepped up and sale and supply entrusted to private sector agencies for large-scale distribution.

Access to media
Radio and television have opened up new possibilities of reaching all parts of the country through FM, satellite broadcasting (INSAT-1B, 1C, 2), uplink

facilities and microwave transmission. Transmission technology and facilities are far ahead of educational software production capabilities, manpower development, and management of community access to radio and TV. In spite of the wide physical reach of broadcasting there are serious lags in two directions. First, the full potential of radio (costing only a few hundred rupees and easily operated on a battery) has yet to be realised. Once local FM stations are created, one in every district, during the Seventh Plan, the potential for educational applications would be enormous. The limitation would be the regional capability to produce relevant software. The second lag is in the area of software for children, teachers, youth, adults etc. A careful choice has to be made between enrichment material and curriculum material, between what can be transmitted through broadcasting and disseminated with the non-broadcast mode or even both. How does one provide access to radio and TV to children in a school or community? Who would have custody of sets; who would operate and maintain the equipment? Alternatives to the present arrangements have to be found, so that one agency, in a decentralised manner, is responsible and accountable for providing access.

The technology of transmission through various transponders (S & C Band) in different satellites could provide the necessary boost for all these activities. One can foresee the need to operate a separate channel for education or even having a satellite especially for what could emerge as an Educational Broadcasting Service.

The audio cassette and half-inch video cassette certainly open up new possibilities of non-broadcast mode use of software in education, especially in the teacher-training programmes and Open Schools/Universities. The software required would have to be serialised on definite subjects. Attempts to provide VCRs in schools on a wide scale at the present juncture is, however, not without the danger of (1) misuse of the machine, (2) poor maintenance, (3) loss of valuable foreign exchange. The money (about Rs. 20,000) spent on a VCR and TV set for a school could better be invested in books for the library, science kits and intensive teacher training programmes, or even media of a more interactive nature and on a radio set.

A survey of TV sets[12] in Delhi schools showed that, at any given time, not more than 75 per cent of the sets were in working order and, out of that, not more than 38 per cent were turned on for children to watch. In Gujarat when the Kheda Project was in progress, the number of sets working at any time was 50-60 per cent. The available data from the six INSAT States (UP, Bihar, Orissa, Andhra, Maharashtra and Gujarat) indicate that the operating Direct Reception Sets could not be more than 20 per cent. Providing radio or TV sets is easy, making them operational in a school or community is extremely difficult. Operation, maintenance and utilisation depend largely on the infrastructure of the education system itself at that level and the attitude of the teacher. If there is no building, blackboards, furniture or adequate teachers, for one reason or another, a Two in One, TV or VCR will not survive. Access to and availability of materials such as computers, VCRs; film and slide projectors is possible at present only in the 'public' or Central Schools. In some teacher training institutes and university departments of education too this may be possible. For the rest, it is going to be a distant dream even to have a book library, science kit and simple aids in each school.

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[12] Study into Utilization and Comprehensibility of School Television in Delhi, A Report, CET, 1980.

In the opinion of this author, good teaching requires basic facilities in schools—toys, games simple materials and an intensive in-service teacher training programme (using the media). The place and priority of media in relation to other basic facilities in an elementary school is shown in figure 5 in the form of a triangle. The stability of the triangle comes from its base. Only when this foundation is laid can the machines be effective in improving the quality of education.

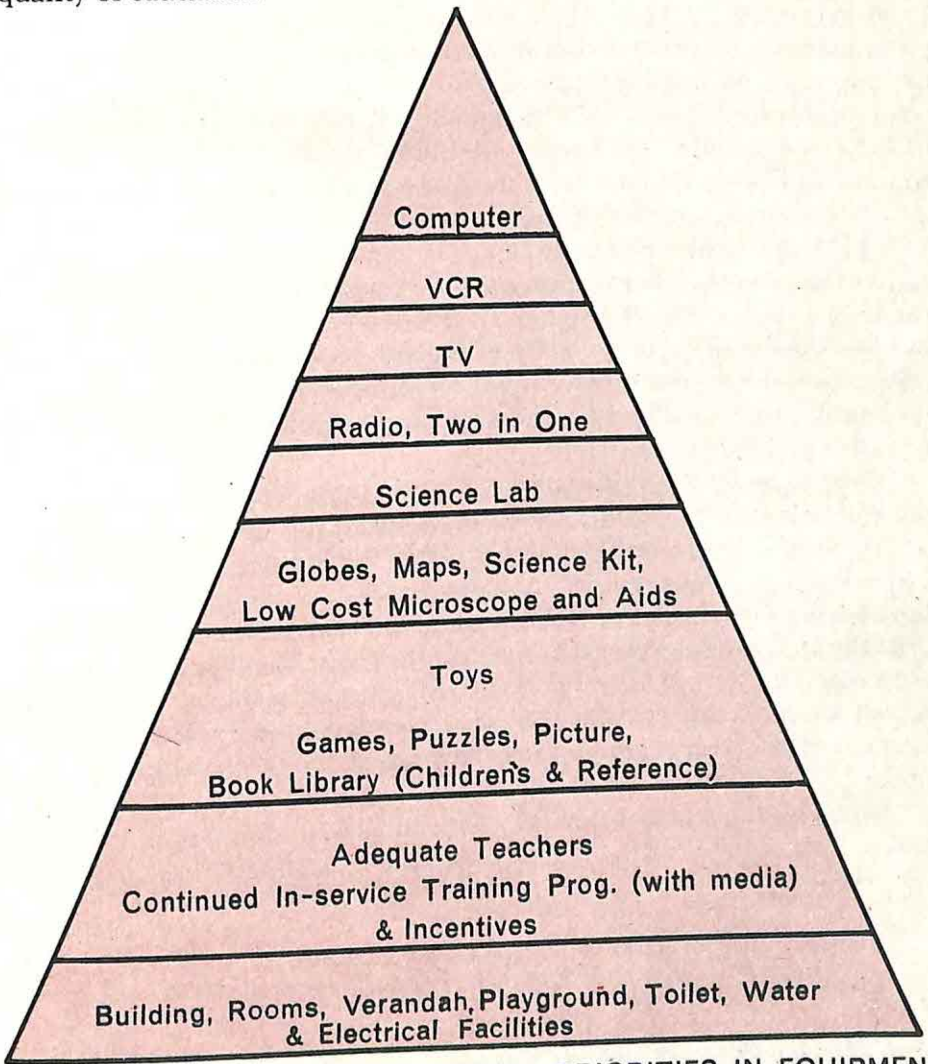
Computer
VCR
TV
Radio, Two in One
Science Lab
Globes, Maps, Science Kit,
Low Cost Microscope and Aids
Toys
Games, Puzzles, Picture,
Book Library (Children's & Reference)
Adequate Teachers
Continued In-service Training Prog. (with media)
& Incentives
Building, Rooms, Verandah, Playground, Toilet, Water
& Electrical Facilities

FIGURE 5 TRIANGLE REPRESENTING PRIORITIES IN EQUIPMENT BUILD-UP OF SCHOOLS

Teachers' continued in-service education

Even more rapid than the population explosion is the knowledge explosion. The latter has been doubling every eight or ten years for the last three decades. This means that all of us, and the teacher, tend to become outdated in our knowledge and tools of perception within 15-16 years or in the midthirties age of the teacher. Hence, to counter deterioration in the standards of teaching at any level, and more so at high school, continuing education for teachers would be necessary and they will have to be offered incentives to acquire new knowledge. This augmentation would especially be required in the sciences and mathematics.

Our numbers of children, teachers and schools are very large. In 1982, there were 53,000 secondary schools with 9,42,000 teachers in them. In 1985, one can assume these numbers to be around 55,000 secondary schools, and more than 10,00,000 teachers. How does one reach this number with training programmes—not just one-shot affairs, but on a continuing basis. Along with the approximate numbers quoted above are nearly 500 secondary teacher training institutes with a staff strength of 15-20 each in different subject areas, making the number of teacher educators around 8,000. These teacher educators (TE) would have to be the first target population to be upgraded, also on an intensive and continuing basis.

This large number of teachers and teacher educators cannot be reached by conventional methods of teaching. The best teachers need to be deployed to reach the vast numbers through mass media—TV, radio, print and personal contact. During 1975-76, the Satellite for Instructional Television Experiment (SITE) demonstrated the capability of orienting nearly 48,000 teachers across the country with satellite broadcasts and multimedia package (MMP) in two workshops of 12 days each.

Many experiments in distance education have been tried globally. The successful examples of the Open University in the UK and Pakistan, the STOU in Thailand, the Television University of China, and so many other countries have demonstrated the capability of imparting quality education through mass media, print, multimedia packages and contact. Encouraged by this, the Indian Government has set up the Indira Gandhi National Open University in New Delhi. But quality distance education is difficult and complex to organise and manage.[13] The concept of the University of the Air needs to be extended to mount a massive programme of *continuing education* of teachers in India.

Reaching the teachers and TEs with the latest information, knowledge and methodology is not going to be simple. Planning will be required in terms of—

1. Identification of needs in various subject areas.
2. Identification of course teams.

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[13] M.M. Chaudhri, 'Look Before You Leap', *Sunday Indian Express*, 12 January 1986.

3. Development of courses and identification of appropriate media and materials.
4. Preparation of software (print and non-print).
5. Identification of appropriate calendar and timings to suit the teachers and TEs.
6. Development of infrastructure and management system for the distance education programme.
7. Arrangement of the transmission of audio and video tapes with Information and Broadcasting Ministry.
8. Identification of contact persons.
9. Training of contact persons.
10. Scheduling the training programme.
11. Evolving the examination system and many more steps.

With the present technology framework, the following phasing of the training of teachers is suggested:

1. *Phase one*
   Upgrading the teacher educators in the area of sciences and mathematics in the 500 teacher training colleges on a year-round basis. The number of TEs in physics, chemistry, biology and mathematics may be around 2000. They would get the training through TV, print and contact. The TEs would get credit after examination at the end of the course(s). The TTC would be equipped with minimum laboratory facilities for sciences and mathematics.

2. *Phase two*
   The second phase would consist of reaching the subject teachers of high schools who may number about 2,00,000. This training would be imparted at the 500 TTC for a period of one month each for 50 teachers at each centre, again with TV, print, contact and laboratory. The next month another group of 100 teachers would come for a similar course at the TTC. Thus in the two months course training will be imparted to 500 × 50 × 2=50,000 teachers. In two years 100,000 teachers would get trained. This would be repeated every year. In the third year, the first batch of teachers would be brought in once again while the TEs are given training in further courses.

3. *Phase three*
   After the secondary teachers have been trained, the 20,000 best among them, become the resource persons for the primary and elementary teachers. The batch of secondary teachers who have received training the previous year will be assigned the next year the task of training the elementary teachers for a month in the Basic Teacher Training Institutes. Thus, the cycle for secondary teachers would be training (one month) in year one; teaching (one month) in year two; training (one month) in year three . . . and so on.

Future

As opposed to the earlier attempts to provide training and to generate educational software at one or two places in the country, large scale plans, though largely through the centre, have been undertaken in the Sixth Five Year Plan. They consist of:

1. Establishment of the Central Institute of Educational Technology at New Delhi.
2. Formation of six State Institutes of Educational Technology (SIET) at Pune/Bombay, Ahmedabad, Hyderabad, Lucknow, Patna and Bhubaneswar.
3. Setting up of Educational Media Research Centres (EMRC) at Jamia Millia Islamia, Gujarat University, Poona University, Central Institute of English and Foreign Languages (CIEFL) Hyderabad.
4. Expansion of video/film facilities at Technical Teachers Training Institutes (TTTI) in Chandigarh, Madras and Bhopal.
5. Other facilities for video at the Agricultural University at Pantnagar, Institute for Telecommunication at Ghaziabad, Indian Institute of Technology, Kanpur.
6. The facilities at the Development and Educational Communication Unit, (DECU), Indian Space Research Organisation (ISRO) at Ahmedabad and Film and Television Institute of India (FTII), Pune are used for in-service training of Doordarshan staff.

Before more states are brought within the INSAT fold in the Seventh Five Year Plan, there is a need to look into delinking these systems from educational departments and making them operate with a new management structure required especially for media. The tasks in educational broadcasting are quite different from those undertaken in education departments.

The following tasks need to be taken up for proper and long-term development of educational broadcasting:

1. *Setting up of facilities (building and equipment) for software production in the regional languages by*
   (i) Educational departments
   (ii) Private individuals working on contract for the educational sector
2. *Training of personnel in*
   (i) Software production (research, scripting, direction)
   (ii) Camera, sound, editing etc.
   (iii) Maintenance of hardware (for production)
   (iv) Maintenance of hardware (for utilisation of TV, radio set, VCR, solar power packs)

- (v) Survey and research for optimum utilisation of media in formal and non-formal education.
- (vi) Media management
- (vii) Information and documentation

3. *Setting up of facilities at the reception end in terms of*
   - (i) Proper building or viewing space for in and out of school audience
   - (ii) Stable electric supply through power station or solar pack
   - (iii) Custody, operation and maintenance of the TV set, VCR etc
   - (iv) Communication and transport system for repair/replacement of set
4. *Establishing satellite, uplink, microwave, terrestrial transmission facilities in collaboration with I and B/Doordarshan for*
   - (i) National network
   - (ii) Regional transmission
   - (iii) Separate channel
5. *Duplication, sale and supply of material on a commercial basis.*

There are not enough trainees around the country either in hardware or in software. Nearly the same dozen or two are required in different courses presently running at Space Application Centre (SAC), FTII, Central Institute of Educational Technology (CIET). Hence the training courses would need to be contracted out to organisations such as the Asia Pacific Institute for Broadcasting Development, Kuala Lumpur, for some years to come.

New methods of media management need to be evolved to create professionalism in educational broadcasting. Perhaps an Educational Media Corporation in the tradition of the Computer Maintenance Corporation (CMC) or National Film Development Corporation/State Film Development Corporation or public sector undertakings like Uptron, Meltron and Keltron need to be created at the state level for training in production of software and maintenance of community sets at the rural level. More structures need to emerge with government assistance from entreprenuerial and voluntary groups to work on educational media, broadcasting and technology.

A three-tier model is necessary:

1. Central Institute of Educational Technology
2. Four Regional Centres for Research and Training
3. State Centres for Production and Maintenance. (Government/Autonomous/ Voluntary)

Machines by themselves are neither good nor bad. They are mere products of technology brought in largely for entertainment and information flow.

Education has been slow to change with technology. At best it follows technology either to adopt or adapt. But a stage has to emerge where it begins to dictate technology so that machines and systems are created to suit the needs of children, teachers, schools and adults. When that age is ushered in the meaning of educational technology and media would become relevant for all. Till then, we must continue to create software with the best talent and machines in the country to reach the widest cross-section of the people and then ask the question: How could we do better?

A.K. JALALUDDIN

Problems of Transition of Rural Indian Society from Oral to Written Tradition through Adult Education

A.K. Jalaluddin

A.K. JALALUDDIN (b. *1934) did his doctorate in applied physics at Calcutta University and in physics and mathematics at Moscow State University. He held many responsible posts including Director, Literacy House and Director, Directorate of Adult Education, Ministry of Education and Culture, Government of India. He was member of many technical and professional bodies including the Raja Rammohun Roy Library Foundation, Calcutta; Standing Committee on Education and Training, National Labour Institute, New Delhi; Indian Council of Agricultural Research Society; and Executive Committee, Indian Institute of Mass Communication, New Delhi. Currently the Joint Director of NCERT, he has written about fifty research papers and monographs in physics, science education, educational planning, adult literacy and development strategies, including a monograph entitled* Monitoring of Literacy Programmes *published by Unesco and has edited an anthology,* Science and Man.

Problems of Transition of Rural Indian Society from Oral to Written Tradition through Adult Education

INDIA, HAVING A RICH ORAL TRADITION, YET WITH NEARLY TWO THIRDS OF its population still illiterate and more than half of them below the poverty line, poses a challenging task to the literacy workers of not only reducing the socio-economic disparities but also of bridging the gaps between the oral and written traditions in the context of a pluralistic and multilingual society. The present paper summarises the experiences of a large number of literacy workers and adult educators who have been grappling with the problem of establishing the socio-linguistic base of literacy teaching and learning and linking the mother tongue of the linguistic minorties with the standard regional languages since the launching of the National Adult Education Programme in 1978. The focus on the adult learners' needs in the programme facilitated the introduction of a new pedagogy with emphasis on their internal motivation, development of social awareness and a critical consciousness. The immediate and perceptible behavioural outcome of an effective adult education centre has been found to be a comparatively higher degree of articulacy, power of discrimination and a sense of knowledge organisation and protest orientation. However, as much of these behaviours are qualitatively assessed through conversation and reading, the above developmental indicators may essentially highlight a modulation on the existing oral traditions rather than a transition to behaviours indicative of the tradition of writing.

In keeping with recent trends in the international literacy movement, the emphasis of mass literacy programmes in India shifted from 'literacy' to 'adult education' through the intermediate phases of 'functional literacy' and 'non-formal education' during the last fifty years (Jalaluddin 1978). The 'Policy Statement' of the present programme highlights the development of functional competencies and awareness of the adult learners as two of the three equally important components of the National Adult Education Programme (1978). The third component is obviously literacy. Literacy materials are by and large prepared on the basis of the eclectic method of literacy teaching and learning, with built-in functional and awareness ideas in the key words, sentences and visuals; also, special discussion sessions between the adult learners and the instructors, animators or other resource persons as well as utilisation of the traditional methods of oral and aural communication are strongly recommended under this programme (Ahmad 1978). The centrally planned programme further recognised the need to decentralise the process of resource development—without any significant language planning. As a result, most of the fifteen State Resource Centres, located generally in the capital city of the respective States with a constitutionally recognised state language, brought out written basic literacy materials mostly in the respective standard languages of the States. The above limitations of the resource development capability below the State level revealed for the first time the gaps between the perceptions of traditional adult educators and professional linguists. These two groups were brought together in a national seminar organised by the national Directorate of Adult Education in collaboration with the Central Institute of Indian Languages at Mysore in August 1978. The proceedings of the Seminar, subsequently published as a monograph, only demonstrated the thaw in the long standing confrontation between the two groups on the issue of 'formal' versus 'non-formal' and alphabetic versus eclectic methods of literacy teaching (Rao 1979). The adult educators, by and large, understood literacy teaching and learning essentially as a means to transfer the functional skills and to 'conscientise' the adult learner, while the socio-linguists and language teachers saw something more in the process of tranferring the reading and writing skills to the adult learner. Within a span of four years since the above seminar, there has been a tremendous change in the perceptions and attitudes of adult educators in relation to the major issues of language and script planning, as revealed in the 'Report of the National Seminar' on adult education programme for linguistic minorities and tribal population orgnised by the National Directorate of Adult Education in collaboration with the Xavier Institute of Social Service at Ranchi (1982). Among other recommendations, the report of the seminar contained the following:

> The content of the instructional material should be localised, that is, the local tribal needs and aspirations pertinent to their environment must form the basis of the instructional materials. It was felt that since these learner groups have to be encouraged to become functionally literate, the teaching-learning materials should be designed to enable the learners to make a transition from mother-tongue literacy to regional language literacy. This task should be completed within the total adult education programme.

The language scene

While 1652 mother tongues have been identified in the recent censuses in India, only 15 major literary languages, namely, Assammse, Bengali, Gujarati, Hindi, Kannada, Kashmiri, Malayalam, Marathi, Oriya, Punjabi, Sanskrit, Sindhi, Tamil, Telugu and Urdu have been accorded political status under the Eighth Schedule of the Indian Constitution (Gopal 1966). The State boundaries by and large coincide with the predominance of the population speaking the major language of the State or the Union Territory, all of which are not covered under the Eighth Schedule. English happens to be the official language in the States of Nagaland and Sikkim, though the Naga group of languages and Nepali represent majority languages in the respective States. Similarly, while Urdu is recognised as the official language in the State of Jammu and Kashmir, the spoken languages of the overwhelming majority of the people in the Kashmir valley and the Jammu region happen to be Kashmiri and Dogri-Punjabi respectively. The linguistic minorities in most of the major States generally speak the standard regional languages of the neighbouring States. However, some of the regional or State languages have diglossic variations—with widespread differences in the spoken and written forms of the language (Sugathapala 1976). The Hindi speaking States of Bihar, Uttar Pradesh, Madhya Pradesh, Rajasthan, Haryana, Himachal Pradesh and the Jammu Region of the Jammu and Kashmir State offer an interesting study in the local variations in the spoken and in some cases in the syntactic forms of the language. Some of these variations such as Maithili and Bhojpuri in Bihar, the Rajasthani languages in Rajasthan, Pahari in Himachal Pradesh are popularly considered as independent languages. A mixture of Hindi-Urdu both in the spoken and the written form, are also widespread in this region, with a greater shift to the Urdu vocabulary towards Punjab and Jammu. Maithili, Bhojpuri, Rajasthani and Pahari are written in the Devnagri script. These languages are also used as the media of instruction at the primary school level.

Apart from these local variations of regional languages having a written tradition, about 400 tribal mother tongues are spoken by the indigenous linguistic and ethnic minority groups. These languages do not have any significant written traditions and their speakers constitute about 7 per cent of the total population of the country. These tribal languages come under four broad categories of language groups in addition to the Indo-Aryan language family: Tibeto-Burman, other Tibeto-Chinese, Dravidian and Austric. The population speaking a particular tribal language is generally well below one million, except in the case of Santhali (Austric), Bhili (Indo-Aryan), Gondi (Dravidian) and Oraon (Dravidian), where the respective population figures are nearly 3.8, 3.4, 1.6 and 1.3 millions respectively, according to the 1971 census (Tiwary 1982). The largest tribal group, Santhals, spreading over Assam, West Bengal, Bihar, Andhra Pradesh and Orissa, have recently emerged both linguistically and politically as a powerful group, with the deliberate introduction of the *Ol Chiki* script by Raghunath Murmu to overcome the influence of the dominant Bengali language and script in the region (Singh 1982). Almost in every other case, where there had been significant attempts to introduce the written form of a spoken tribal language, for example, the Naga group of languages, Mundari, and Oraon, the script of the standard regional or official languages and, more frequently, Roman and Devnagri scripts have been chosen.

Bilingualism and biliteracy

While the census records in India mention about 9.7 per cent of the Indian population being bilingual in the sense that they speak a 'subsidiary language' in addition to their mother tongues, there has been very little systematic tabulation of data on bilingualism. The prevalence of bilingualism and biliteracy in an Indian State by and large indicates the impact of the existing school system on the minority speakers, having a standard regional language other than the standard State language as their mother tongue. For example, in the non-Hindi regions, over 46 per cent of the population of the minority speakers are exposed to English and Hindi-Urdu. Similarly, in the Hindi region, 32 per cent of the Hindi-Urdu speaking population are exposed to English. However, the extent of bilingualism of the minority linguistic groups in the dominant State language on an average in an Indian State is only 20 per cent (Ekka 1982).

Bilingualism among the tribal population in a State has different finer shades and contexts. Where more than one tribal groups are located in the neighbouring areas, as in the North-eastern hill States or in the Chota Nagpur division of Bihar, the bilingualism of a tribe may be in relation to the language of the other neighbouring tribes other than its own. Very often, the bilingualism of a tribal population is in reference to the major language of the State or its regional variant (Ekka 1982).

In the context of a nationwide adult literacy and education programme, the question of the acquisition of more than one writing system or even scripts by linguistic minority groups becomes an important area of language planning. The term biliteracy is used in this context in India. This is also linked to the question of introducing a system of writing for a large number of tribal languages, which till now exist in the spoken form only or on a pre-literate stage. According to Pattanayak (1982), there is a 'second dimension' to this complexity, where in many tribal areas a pidgin happens to be the language of wider communication, for example, Nagamese in Nagaland, Sadri in parts of Bihar and Madhya Pradesh, Desia in Orissa.

The script controversy

The emotional and political overtones regarding the choice of a script for a pre-literate tribal language are at times overrated (Daswani 1982). Except in the case of Santhali, there had been no significant controversy about the choice of a script other than the script used for the standard literary language of the region. As the *Santhali* population is one of the largest tribal groups, distributed over four States with four standard languages using distinctly different scripts (Bengali, Oriya, Hindi and Assamese), it may not be an altogether irrelevant attempt to develop a script having orthographic similarity with more than one of these scripts in order to promote the common identity of the Santhali speakers. That is what Raghunath Murmu tried to do while developing the *Ol Chiki* script, by incorporating some orthographic forms from Oriya, Bengali, Hindi and Roman (English). In March 1981, the

Marxist Government in West Bengal recognised *Ol Chiki* as a medium of instruction on the primary level.

More recently, Lakho Bodra, a former railway clerk born in 1922 in Bihar in the Ho tribe claimed that the lost script, *Varno Kshiti*, the shining letters of the Ho people, were revealed to him at the end of a forty-day-long ordeal in a cave. He brought together the pieces of markings on the rocks and inscription from different parts of the region inhabited by his tribe and further 'discovered' the script.This consists of 31 letters, each with a capital and small form, as in the Roman script.A remote influence of the *Brahmi* script could be seen in the forms of some of the letters, but many new forms have been added (Singh 1983). However, unlike the *Ol Chiki* movement, Lakho Bodra's script could not gain momentum.

There had been several other attempts to discover or re-discover scripts by other tribal communities, like the *Chakmas, Sevaras, Meites* and others. But wherever a movement of a tribal language gained momentum as in the case of *Kak Barok,* a tribal dialect of a half a million tribal people in Tripura consisting of six groups and two sub-groups, and the *Mizos* and *Khasis* in North Eastern India, the script adopted by these linguistic groups turned out to be that of a standard literary language, Bengali in the case of Kak Barok and Roman in the case of the others. Many tribal groups in the central part of India have by and large adopted *Devnagri* for inter-tribal and tribal-non-tribal communication.

Bridging the gap

One of the major concerns of a literacy movement is the retention of literacy through continuing use of the skills of reading and writing. For most of the neo-literate communities which also happen to be socially and economically backward and vulnerable to manipulation by the more articulate sections belonging to the same and other linguistic groups, literacy is also the medium for the promotion of their social skills, for the orientation of protest and for general awareness. The choice of the script for a pre-literate language and promotion of biliteracy with the standard regional language as the subsidiary language are now issues of crucial importance in India. In this context, the question of a minority language being 'assimilated' or 'integrated' by the dominant regional language is currently being debated in the country (Bogaert 1982). While most adult educators and linguists do not see any threat to national integration and the existing political system by promoting adult literacy and education initially through the mother tongue of the adult learners, the State level agencies responsible for implementing such programmes are apprehensive of the outcome of such moves. However, a consensus seems to be emerging in favour of using the script of the standard regional language for teaching literacy through the mother tongue of the adult learner and using the vocabulary commonly used or understood by them, irrespective of the origin of the words, wherever a different script is not used for writing the mother tongue of the learner. In the absence of a writing system for a minority language, the writing system of the standard regional language is generally introduced as a 'bridge'. This 'bridging' method is yet to be put on a technically firm footing (Ekka 1982). The transition from the mother tongue to the standard regional language, wherever such attempts at bridging have been made, has remained rather abrupt. It very often takes the form of teaching basic literacy in the mother tongue followed by the reading of materials written in the standard regional language.

Till now, only one significant research study is available which aims at measuring "the effects of using the dialect of the learners at the initial stage of acquiring functional literacy skills in the standard regional language" (Srivastava 1982). The design of this study was structured to identify the gains in functional literacy skills when the initial exposure to written text was in the dialect, as compared to the gains when initial exposure was in the standard regional language which was not the learners' first language.

The sample consisted of 369 learners distributed in two groups of adult education centres. One group was instructed in reading and writing daily at the basic literacy level, first in the mother tongue (using the script of the standard regional language), and then in the standard regional language. The other group went through the programme, from the beginning to the end, in the standard regional language. The achievements of the two groups were measured through a functional literacy test using the criterion reference method.

On the basis of the evaluation of the data, Srivastava concluded that there was no significant difference in the learning achievements of the two groups in terms of the acquisition of functional literacy (1982). However, the dialect group showed a higher degree of motivation and interest in learning to read and write. The study could not, therefore, lead to any conclusive decision about the choice of language in a local adult literacy programme.

The question of longer time involved in biliteracy education and the non-availability of an adequate number of literacy instructors from minor linguistic groups of adult learners and suitable bilingual or bridge materials very often compel the local-level providing agencies to switch over to the literacy methods and materials which are readily available in the standard regional language.

National and international dimensions

The movement of the linguistic minorities and the tribal groups in India for the establishment of their identity has so far remained intimately linked with the greater national struggle of the Indian people for independence and socio-economic development. Many of the well-known tribal movements in Central India in the colonial days aimed at regaining economic rights on land and more recently on forests. The struggle of some tribal peoples for political rights, as more pronounced in the North-Eastern region of the country, where they constitute the overwhelming majority in the region was not the result of any threat to their linguistic and cultural identity. Many of these tribes, living in frontier areas, traditionally acted as bridge or buffer communities and remained relatively isolated from the cultural system of the mainland and the political upheavals of the freedom struggle (Singh 1982). The most important tribal movement in Eastern India is the movement for the establishment of a Jharkhand State. A deeper analysis of the transition from ethnicity to regionalism as symbolised by the formation of the Jharkhand Party in 1949, might reveal the process of democratisation of the Indian society which immediately preceded and followed the framing of the Indian Constitution in 1950 under which the tribal people had been awarded more rights and privileges, at least in principle. On this background, the Jharkhand movement does not differ from other regional movements of non-tribal people such as that of *Telengana* in Andhra, *Bidharva* in Maharashtra and, for that matter, the Punjabi Suba movement of the fifties and sixties.

What has become more pronounced in the seventies and early eighties seems to be a form of cultural or religious revivalism among the linguistic minorities and the tribal population in some areas. It may be just a coincidence that the World Council of Indigenous Peoples was formed in 1975 with overtly political objectives, such as

- to ensure unity among indigenous peoples
- to facilitate meaningful exchange of information among the indigenous peoples of the world, and
- to strengthen the organisation that form political and cultural channels of the indigenous peoples in the various countries. (Sommerlad 1981)

According to the same source (Elizabeth Sommerlad--of Australian National University, who is also the Coordinator of the Council in the Asian and the Pacific region), the President of the Council in its recently held World Assembly in Australia in April 1981 set before the Council the task "to revive and strengthen ancient indigenous ideology, including culture, religion, language, and laws, to work towards the goals of self-determination and self-reliance, to tell our children how to channel the resources from education to strengthening our nationhood". Sommerlad enquired how adult education could assist the indigenous people in achieving the above objectives.

In the context of the continuing gaps between the aboriginal peoples in Australia, the indigenous peoples in North America and the African peoples in South Africa and Namibia on the one hand, and the white settlers in these respective areas on the other, the effort on the part of the indigenous peoples to resist the process of assimilation by an altogether alien culture is a positive development. However, the implied objective to link the movement of the indigenous peoples in the developed countries with that of the linguistic minorities and tribal groups in the developing countries in Asia and Africa cannot but raise many fundamental issues. These issues are not independent of the methods through which developed countries tend to influence and decide the development philosophy of developing countries.

The monolithic, technologically advanced and highly organised Western nation-state have had the colonial tradition of unburdening their load on their colonies in the olden days, and of late on the developing countries. Much of their domination of the developing countries is now taking place through the softer areas of transnational cultural and ideological interactions. Pattanayak has rightly pointed out that "Nation-states in the West, built around unitary symbols, find in multilingual, multi-ethnic and multicultural Asia and Africa a challenge which they are unable to cope with" (1982). In the absence of any similarity between the indigenous peoples in the two different contexts, unqualified support of the political linkage between indigenous peoples all over the world may give currency to the so-called parallelism between the racial scene in the West and the cultural pluralism in the developing countries, and thus accentuate the already existing problems of national integration in some developing countries.

Sociology of adult education

In the context of the Indian multilingual scene, there has been widespread and multidimensional interaction between different linguistic groups for thousands of years through a rich oral tradition. Many of the conflict situations between the tribal and non-tribal populations in the present-day context are essentially due to the uneven pace of socio-economic development and the transition of different communities from oral to written tradition with the process of modernisation of the Indian society. There is also the lack of an effective land reform, agrarian policy and community participation in the process of development. If and when a literacy worker faces deliberate opposition at the local level, it is essentially from the local people representing social and economic vested interests, or even the influential members of the family of a potential learner, irrespective of their linguistic or ethnic origin. Therefore, any pedagogy developed for adult learners essentially keeping in view their group identity, may not lead to their liberation from the dominant section of the group. Such pedagogy may not actually resolve the problem of domination of the less articulate by the more articulate, who represent the tradition of writing in a developing society. On the contrary, the primacy of group identity in any pedagogy may promote instinctive feeling and passion and confuse the issue of the liberation of the learners mainly on two counts. First, it blurs the ultimate goal of education, which is development of each individual learner and his or her liberation from the provincialism of time and space, and second, it removes to the background the major socio-economic factors and forces which are responsible for his or her predicament. A pedagogy which falls short of reaching the goal of the learners' self-regulation, and confines itself to group regulation, does not liberate them from their manipulators. At most it could help them to change their manipulators.

The dilemma of the adult educator committed to the objective of 'conscientising' the adult learner for the promotion of his or her ethnic or linguistic identity, lies very often in the temptation to use literacy as a means of restructuring the power base of the society. However, in the absence of a root in the more decisive regulatory social and economic forces, educators may find, to their utter frustration, that as such a political movement crystallises, the leadership of the group might prove to be more vulnerable to the on-going process of cooption by the establishment. Thus the 'liberating' and 'domesticating' roles of adult literacy with focus on group identity may prove to be the two faces of the same coin at two points in time, contradicting Goodluck's theory (1981).

Vitality of the oral tradition

In ancient India, the transmission of knowledge (even in the pre-Buddhist period) was systematically carried out over centuries in the form of recitation and organised memorisation (*sruti*). The distinct systems of knowledge which were subsequently found in the post-Buddhist period in the recorded form relate mainly to philosophical disputations, astronomy and *ayurveda*—the indigenous system of medicine. However, the major sources of handwritten manuscripts happened to be the Buddhist and Jain preachers. The handwritten texts of this period were in the form of verse or discourse following a repetitive and cyclic style to facilitate memorisation and internalisation. In the context of ancient India, the Buddhist and Jain preachers played an important role in democratising the process of popularisation of knowledge, values and attitudes. The diversification of the materials used in writing down those texts also weakened the Brahminic resistance to the participation of the common people in the system of writing. This process was accelerated with the advent of the Muslim rule in Northern India in the medieval period, with the large scale super-imposition of the Persian language and script. However, till the introduction of printing technology and modern education by the British missionaries in Bengal in the eighteenth century, the circulation of handwritten manuscripts as the only written materials had little impact on the progress of literacy.

Parallel to the above changes in the languages and scripts at the level of the rulers, there arose a line of Saints and Mystics who brought the wisdom of the ancient Rishis and Acharyas to the common people as pilgrims, communicating in the local language, and using the medium of song in their mission (Raghavan 1978). These Saint poets from the post-Sankara period till the British period in India were great educators. More important yet is the fact that all of them in their songs and discourses highlighted the unity of humankind and the corporate consciousness of the Indian people. Their common pursuits to discover the self and to regulate the mind, not by subduing it, but by going round it, gave their listeners and followers a sense of freedom and a perception of their inner potential. Their method of educating the people and making them aware was through homely language with similes, symbols, satire and sarcasm and direct transfer of feeling, emotion, values, attitudes and reasoning, rather than through the contemporary hierarchical method of starting with information, leading to cognition and understanding.

Only in the earlier part of the present century Vivekanand, Tagore, Aurobindo and Gandhi could see the strength of the learner-centred, holistic nature of the traditional and informal system of mass education in India. They tried, each in his own way, to enunciate and demonstrate their own philosophy of education. Gandhi, being directly involved in the independence movement as its rallying point could see the need to link the cultural development of the Indian people as a whole with his philosophy of economic and social development. In Gandhi's frame of reference the individual, and the poorest and smallest communities were always in the centre and not at the periphery. In his experiment with Basic Education, Gandhi tried to correlate mental organisation of knowledge with productive and domestic work. But what many Gandhian practitioners of Basic Education failed to realise is that the formal school system and an artificially created market demand for academic courses, without any correlation with the competencies acquired by the graduates of these courses, was not the right place to introduce innovative ideas in education. It is in the background of these failures of the past that many voluntary agencies in the country could identify their appropriate role in new adult education programmes.

Evaluation studies

Unlike in many other countries where mass adult literacy and education programmes had been launched in the recent past, in India a number of systematic evaluation studies have been concurrently carried out with the implementation of the National Adult Education Programme in the individual States. These studies had been planned and conducted by leading social science research institutes. Out of the several studies published so far, the "National Adult Education Programme in Maharashtra: An Evaluation" conducted by a group led by Hebsur of Tata Institute of Social Sciences, Bombay, aimed at investigating the relative influence of modernisation, the exposure to mass media and to literates in the family of adult learners and potential learners as variables along with the more commonly used ones as teaching-learning materials, topics taught, etc. (1981). The study also attempted to investigate the interdependence of the achievements of the adult learners in the three major components of the programme: literacy, functionality and social awareness.

The socio-economic and other characteristics of the learners, which were found to be positively and significantly associated with the rural learners' acquisition of literacy in the study were: sex, caste, occupation, exposure to modernisation, regularity in attendance, and possession of learning materials. In the case of urban learners, caste and exposure to mass media were found to be positively and significantly associated with their performance in literacy, while income was found to be negatively and significantly associated.

Taking literacy, functionality and social awareness together, the investigators found that the learners who acquired a high level of functionality had also acquired a high level of social awareness through the adult education centres and vice versa. Acquisition of literacy skills, however, was not in the same way associated with functionality and social awareness.

Besides the systematic evaluation studies mentioned above, several personal accounts and individual case studies also have revealed the new dimensions of adult education in India. Vidyarthi narrates (1982):

> I have known intimately at least one *Birhor* (a minor tribe in the pre-marginal, pre-farming and pre-literate stage) adult, Mankira who responded to the lessons of adult education imaginatively. He was living in a remote *tanda* (temporary village), 6 miles off the Bishunpur Block. His education advanced not in terms of literacy but in terms of understanding the socio-economic and educational problems of his community. His education advanced by a sort of natural method, in which his mind moved back and forth between the problems of conduct and action for his self-development and that of the members of his *tanda*. With his help, Birhor families were resettled in the colonies of Jahangutua and Beti. When his eyes were failing, he agreed to come to Ranchi for treatment and realised that "the God of the outsiders is more effective than that of the forests", as his cataract was removed and he could see his tribal world more clearly. This man developed a slow but powerful curiosity about everything, and the course of his education, limited as it was, carried along in strong conviction of his responsibility to do right and to help the progress of his village.

Basu Roy Chowdhury, in another paper narrated how he developed an informal tool for evaluating the achievement of an adult learner (1982):

> My respondent was Mahammad Yusuf, 30 years, husband of a class IV pass wife, father of 4 children, one of whom was in class VI, another in class V and two others in class IV. Mr. Yusuf was an illiterate before he joined the 'class'. It is now almost a year that he is in the centre. He can read road signs, addresses, newspaper headlines and simple passages in Hindi, if printed or written boldly and can comprehend if the message is not too complicated. He can read and write in Urdu, can understand almost half of what he reads.

When the investigator probed further to ascertain the respondent's self-assessment of his gains in the context of his family life, the latter stated that he could "check (not help) on education of his children". He could at least see if they had read the language book up to the point they claimed to have studied. The respondent also gave the impression that his wife liked his joining the literacy class.

In another evaluation report, Saraswathi narrated her experience of interviewing women learners in a Tamil Nadu village as follows (1980):

> The literacy experiences of the learners in terms of their emotional experiences in learning literacy, their self-image, showed that there were few really bright sports in the project, who were really touched by their being able to read and understand and who are really proud of their ability

> to read and write, it was indeed worthy of actually hearing them about their emotional experiences and seeing the sparkle in their eyes. But those who could feel intensely and articulate their feelings were very few. If everyone could do it even a purely literacy programme can be considered a programme for building up awareness.

The experiences of some other Asian countries are not much different (Jalaluddin 1982a).

Policy implications

While the diversity in language, script and other regional and local cultural variations in India must be bewildering to a literacy campaign organiser at the national level and more so to a literacy worker from another country with much less diversity, this apparent disadvantage seen from a different angle may actually prove to be an additional advantage in terms of preserving and promoting the diversity and at the same time the emotional unity of the people of India which gave stability to her cultural, social and political institutions, in spite of her slow pace of economic development. There has been a growing realisation in the country that excessive centralisation of the development process makes its implementation more expensive and the participation of the small communities in the rural and remote areas more restrictive. The National Adult Education Programme, while originally planned centrally, made the flexibility and decentralisation of the programme a part of its 'policy statement' (1978). The devolution of resource development had been the cornerstone of the new literacy programme. While till recently only fifteen State Resource Centres had been responsible for developing literacy methods and materials, almost all the States in the country have by now, in principle, decided to decentralise the resource development activity down to the districts, about 400 in number and each with a population of about 1.7 million and more than 2000 habitations and four mother tongues and dialects on an average. The agency for the development of resources in literacy and adult education at the district level, the District Resource Unit, has been visualised to be a network of individual resource persons representing the local spoken and written language or languages as the case may be, university, college and school teachers, development professionals, village level communicators, puppeteers, ballad writers and community level health and extension workers and the relevant institutional infrastructure in the district.

The State Resource Centres, and in some States the district and local level resource units and many voluntary agencies have successfully developed participatory techniques for the preparation of literacy and post-literacy materials and their pre-testing with community support. In some areas literacy instructors and the adult learners contributed to the preparation of written materials. These localised materials very often reflected the spoken form of the language of the learners and because of this, such materials proved to be much easier for the new learners to comprehend. The very fact that the neo-literates could also become the authors of new materials, gave a sense of pride to the learners and credibility to the literacy programmes as a process of renewal of the local traditions and culture (Jalaluddin 1982b).

Promotion of the written tradition through a mass literacy programme in the context of India does not seem to reflect a transition from the 'involved' world of oral tradition to the world of 'detachment', representative of the written tradition as Marshall McLuhan interpreted this phase of transition in Europe (1964). In India and in other developing countries which have experienced, or are in the process of experiencing such a transition through a mass literacy campaign, the individual and societal transformations are rather a form of renewal in nature than being additive or extensive.

It may be interesting to note that the above distinctive nature of cultural transformation in India is very much in unison with the holistic nature of the traditional Indian system of medicine and education. This also brings to the forefront one of the most vital subjects of topical interest—the mind-brain interaction. As has been mentioned earlier, the primacy of emotional development in the *Gurukul* (master-disciple) system of education in India, two of the major objectives happened to be the inculcation of the spirit of detachment and the development of reasoning. Much of the strength of the native wisdom of an Indian lies in these broad areas. Therefore, the success of the contemporary experiments in adult literacy in India should really be evaluated in the light of how the literacy workers and adult educators take advantage of this native wisdom and emotional unity in telescoping the proçess of development and facilitating the process of renewal of the oral tradition by making the sound of emotion and logic visible, so that sight and sound could resonate instead of subduing each other.

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D.P. PATTANAYAK

Teacher Education

D.P. Pattanayak

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Teacher Education

IT IS CONTENDED BY EDUCATIONISTS ALL OVER THE WORLD THAT A GOOD education depends on a good teacher and the quality of the teacher depends on the quality of the teacher education. It is presumed that a university teacher needs no training after obtaining his post-graduate degree, while the primary and secondary teacher needs training to be a good teacher. That is why all quantitative surveys and evaluations of primary and secondary education give statistics on the extent and quality of teacher education. In the following sections an attempt is made to take an overview of primary and secondary teacher education in India, take a close look at education in the universities, and draw conclusions relevant for other pluricultural developing countries.

Elementary level

Primary teacher training in the country is diverse in terms of time, curricular content, management, educational input and student population. Some programmes are one-year post-middle-school courses, some are two-year post-middle-school courses, some are one-year post-matriculation/ higher secondary courses, whereas some others are two-year post-matriculation/higher secondary courses. Although, after a good deal of discussion, a framework for a teacher education curriculum was thrashed out by a joint meeting of the National Council of Teacher Education and the UGC committee on the same subject (NCERT, 1978), the curricular content varies from one state to another. The managements of teacher training institutions are either government, semi-government or private. Urban schools are saturated by educational technology while the rural schools are so starved that there is often no blackboard and chalk. There are schools with one teacher for all the classes, with untrained teachers, and inadequately trained teachers, with varying degrees of subject competence. The eligibility of students is quite varied. Some are first-generation learners, while others come from educated family backgrounds, some are urban while others are rural.

Primary teacher training was considered to be of no significance until the Report of the Indian Education Commission supporting teacher training was released in 1882. Maharashtra was one of the states where teacher training in some form for primary level teachers existed since 1824 (IIE, 1984). As the Indian Institute of Education (IIE) Report points out, in Maharashtra, "During all these years, i.e. between 1870 and 1984, the Syllabus of primary teachers' training was revised several times, i.e. in 1884, 1899, 1910, 1925, 1945, 1966, 1972 and 1983. A radical revision of the primary school course inevitably affects the requirements of training institutions." What happened in Maharashtra, more or less also happened in most other states. As new ideas from the West affected the syllabus, the gap between curricular demand, institutional input and teacher competence began to widen.

Teachers are trained to handle the teaching/learning of students at specific levels. The goal, strategy and methodology specified for a level and the teacher training for that level are intimately related. As Sharma points out: "The syllabus and curriculum developed by the National Council of Educational Research and Training and other State Departments of Education generally do not specify language content in linguistic terms. The norms of linguistic competence of our children, existing as well as expected, are also not known" (Sharma, I.S., 1983). Under these circumstances, there is a gap between teacher competence and curricular demand, as had been demonstrated in the case of Karnataka (CIIL, 1977; NCERT, 1978).

The manner of recruiting students for training is diverse. There are in-service teachers who are deputed for training. Seats are reserved for them. In most training institutions, seats are also reserved for Scheduled Caste, Scheduled Tribe and Backward Class candidates. Often, admission for these categories is by relaxation of norms for admission, be it performance in the last examination, an admission test, or a viva-voce entrance test.

The demand for prospective teachers fluctuates. Sometimes the demand falls considerably and there is considerable unemployment among trained teachers.

The trainers of these teachers are mostly trained graduates, though some also have post-graduate training. What is, however, most striking is the fact that many of the graduates who come for training have graduated with subjects which are not taught in schools. During the training programme, the teacher-training institutions try to achieve the impossible: the twin aims of teaching contents as well as methodology simultaneously. The same is true of correspondence-cum-contact programmes, which are formal alternatives to institutional programmes. No wonder that "There is a widespread discontent at these formal teachers' training programmes, for today, they are looked upon merely as orientation or initiation to teaching-learning processes and not serving the objectives of training the modern teacher." (Bengali, 1985).

Salaries in different states being different, there is a good deal of variation in the quality of trainers. Two weaknesses stand out even in a cursory survey of the situation: first, there is a deficit of science graduates to work as teacher-trainers; secondly, as fields of study are seldom the consideration in appointing teacher-educators in training schools, there are often subjects in training institutions which do not have teachers and teachers whose subjects are of no immediate use to the institutions.

The real crunch is in the instructional programmes. The syllabus for teacher training is often framed by Committees of State Education

Departments who have little idea of the objective reality. While a syllabus taken by itself may be rich in content and ideal and up to date, lack of qualified staff to implement it, lack of inputs such as books, blackboards, science kits, raw material for crafts, or even a play field, makes nonsense of such syllabuses. There is some sort of uniformity in the theory papers taught in these institutions, but the standard of these papers is uniformly low in comparison with the comparable general educational standards. Obsolescence of textbooks and, consequently, methods and materials, is a major problem in most of these institutions. Demonstration lessons and practice teaching are a necessary component of training. But they are so routinised and ritual ridden that lesson plans prepared for such purposes seldom affect the quality of textbooks. There are seldom qualitative evaluation pro forma for practice teaching and, wherever they do exist, they are meant for calculating the workload of the supervisors.

Schools for practice teaching are few and far between. They are selected not necessarily on the basis of academic criteria, but on the basis of proximity to the training institutions, proferred cooperation, availability of accommodation and other facilities. Since many of these schools are inadequately staffed quantitatively, and have staff of poor quality; since many of them are ill equipped and peopled with backward students, the practice teaching in such schools remains a ritual. They do not have the capacity to absorb the benefits of improved methods and materials.

Crafts, agriculture and gardening are compulsory subjects in most states, but the inputs for these are so poor that they seldom create enthusiasm and motivation. Community living programmes are more symbolic than functional. Although the teacher-trainees develop good public relations, seldom do these result in the formation of parent-teacher associations.

If one looks at the results, one is struck by the performance of these teacher-training institutions. Hardly 12 out of 100 go beyond the primary stage. At the secondary stage, on an average, only 30 per cent pass. But in these teacher training institutions, in spite of internal assessment, where one hears of subjective bias, and external evaluation at the end of the term, the results are between 90 and 100 per cent. This is all the more striking as science laboratories, libraries and other academic inputs are acknowledged to be inadequate and unsatisfactory in most of these institutions.

What is really the most persistent and bizarre situation is that, in spite of the many quantitative and qualitative improvements brought about through governmental intervention, is the fact that, "the elementary teacher-educators have no special orientation for teaching in elementary-teacher-training institutions. Most of them do not have teaching experience in primary schools, with the result that they prepare teachers for elementary schools but their personal experience and background are that of secondary schools" (NCERT, 1977). While the Report of the National Survey has made many valuable observations, it has missed the seminal issue. That elementary education is primarily language education is lost on educationists and planners alike.

In multilingual countries, where bridging the gap between the home language and the school languages at successive steps of education, and preparation of the learner to acquire knowledge through different language mediums, is one of the most challenging tasks of education, lack of awareness of this factor has resulted in catastrophic consequences for the countries concerned. Not to speak of dropouts, stagnation and wastage, poor language skills lead to poor mathematical skills and inadequate performatory skills in languages lead to shadow cognition, which is at the root of poor quality education in most such countries, (NCERT, 1977).

It is crucial to understand that the dichotomisation between a subject teacher and a language teacher at the elementary level is a mistake. Even at the secondary level it must be taken with a pinch of salt. In a secondary school, most often a teacher is both a subject teacher and a language teacher. In any case, even language is taught as a subject here. No teacher-training curriculum shows even the awareness of the need to integrate subject competence with language competence.

Secondary level

It is not that only elementary-teacher training is diverse; secondary-teacher training too is out of pace with developments in different subject areas. Secondary-teacher training courses are run by both non-governmental institutions and by state governments. Many universities have instituted teacher training through correspondence courses. While these are considered as cheaper substitutes for formal training institutions, most of the private training institutions are traps for the unwary and money spinners for those who run them.

Firstly, considering education as a separate autonomous discipline inhibits interdisciplinary interaction with different subject fields. Secondly, there is no mechanism for transferring knowledge about improved methods and materials from the cloistered higher educational institutions to the teacher-training institutions. It is only in the four Regional Colleges of Education, created under the aegis of the National Council of Educational Research and Training, that an experiment was initiated to conduct integrated courses in teacher-training in which, how to teach a subject was sought to be imparted along with learning the subject. Thanks to the shifting fads of the educationists and educational planners, these experiments were not given a chance to succeed and have been permitted to dry up, so that they now remain a trickle.

Very little research of significance and relevance is to be seen in most of these teacher-training institutions. Most important studies about dropouts, science teaching, improved curricula, and material production, have been conducted elsewhere. Let alone sophisticated research, even studies of age and grade-wise control of vocabulary and other language elements are conspicuous by their absence.

Many of the secondary teachers trained in these institutions become inspectors of schools. No serious objective parameters have been developed for conducting their evaluations. As it is, the ratio of inspectors to schools is 1:90 in many areas, which is way above the national average. Even the national average leaves a lot to be desired. If even these have no orientation and poor grasp of subject fields, one can only imagine the fate of schools.

One example is sufficient to demonstrate the lacunae. The National Education Policy visualises teaching of three languages in the post-primary, secondary stage. How knowledge of the mother tongue/first language can be used as a resource for learning another is inadequately appreciated, resulting in wastage of time and energy of the learners. While a child manipulates complex structures and discourses in one language, he continues to parrot *The cat sat on the mat* for years, is not seen either by the teacher or by the inspector, as both are of the same vintage. As no distinctions are made between learning a language, learning about a language and learning through a language, no attention is given to register specific language. Consequently, teaching of subjects suffers, and this is carried to the higher-education level. One often hears university teachers complaining that they are doing the job of the school.

Education in the universities

The interest of universities in the study of education dates back to the recommendation of the Calcutta University Commission, 1917-19 (UGC, 1982). Since then, with the growing irrelevance of higher education in meeting the aspirations of the society at large, education has not only failed to prepare teachers for the century ahead, it has even failed to produce teachers who could help their students in coping with the present. Whether teachers would play a revolutionary role in social transformation or, as Jean Floud once said, would continue to be "paid agents of cultural diffusion" is very much part of the contemporary academic debate in India (Shukla, 1985).

The Kothari Commission (1964-66) had emphasised that, "the essence of a programme of teacher education is 'quality' and in its absence, teacher education becomes, not only a financial waste, but a source of overall deterioration in educational standards. A programme of highest importance therefore is to improve the quality of teacher education. This can be done through a number of ways, including strengthening in-service training of teachers." Since then, there has been a renewed search for alternatives to ensure continuous qualitative training. Institutions like the Centre for Advanced Study in Education in Baroda, the NCERT and the National Institute of Educational Planning and Administration (NIEPA) in Delhi, the IIE in Pune and some of the university departments and institutes of education, including those at Viswabharati and Jamia Millia, have done significant reseach in this area. Regional Colleges of Education offered integrated programmes; summer institutes and part-time and short-time courses were offered by various training institutions and correspondence-cum-contact programmes. The Central Institute of Indian Languages at Mysore broke new ground when, in collaboration with All India Radio and the State Departments of Education, it undertook qualitative teacher enrichment programmes in Kerala and Tamil Nadu. By combining broadcast with interwoven correspondence packages it provided a new dimension in handling teacher training on a large scale. In fact, each of the three apex language institutions in the country, the Central Institute of English and Foreign Languages, the Central Institute of Hindi, and the Central Institute of Indian Languages, which are at par with universities, have done much more innovative work in teacher training methods, materials and media utilisation with regard to language education than any single university in any subject area. Unfortunately, this has not had the desired multiplier effect. That is why, even in the field of language education, the teacher training institutions as well as the university departments of education trail behind modern knowledge.

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There has been a qualitative change in the role of the school as well as the role of the teacher. While the schools are called upon to deal with production-oriented society, action-oriented youth and process-oriented education, the conventional accent has been on information transmission, fact finding and skill development. While the teacher is called upon to be a change agent, a mobiliser, a facilitator sensitive to the developmental needs of the community, the conventional teacher training makes him chase mirages of changing models and textbooks. In this process, the traditional wisdom is lost in the quest for dubious knowledge and knowledge is lost under mountains of information.

The present formal education cannot cope with the demands of a developing society without drastic transformation of its structures. The core programme of teacher education in countries like ours must steer clear of fads like computer-aided education on the one hand and chasing a new meta-language on the other.

Teacher training, like any other branch of education, must be viewed as a multi-media, multi-channel action programme to be designed and implemented with full community involvement if it has to serve education and society.

In developing countries, where there is an understandable accent on the eradication of illiteracy, there are often calls to distinguish between a teacher who will remove illiteracy and one who will impart sophisticated knowledge (Sinha, 1967). Such approaches and attitudes are backward-looking as they assume that the illiterate have no need or capacity to absorb sophisticated knowledge. Arising out of this, the low-key approach to literacy becomes ritualistic, or at the most a symbolic gesture, and higher education, imparting sophisticated knowledge, becomes irrelevant for the larger polity. It is incumbent on the education and the communication system to create an educated polity, with or without literacy. Literacy can draw support and sustenance from such efforts.

In most fields of knowledge there has been a division of labour between theory building and consumption of theories in developed and developing countries respectively. Teaching learning is no exception. Theories based on the experience of advanced countries have not only little relevance but have debilitating effects on thinking concerning the developing countries. If education has to be creative and meaningful it must rely on the genius of the country concerned. Some contemporary trends in this direction are visible in the activities of Kerala Sastra Sahitya Parishad, Kishore Bharati etc., which have drawn inspiration for their pedagogy from the grassroots. Teacher education must link tradition with modernity if the plural societies have to be saved from the imperialist hegemony of culture.

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Professionalisation of Teaching

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Professionalisation of Teaching

THAT THE QUALITY OF EDUCATION DEPENDS LARGELY UPON THE quality of teachers is one of the axioms of educational planning. Spacious buildings, modern equipment, textbooks, important though they are, become ineffective unless there are teachers who have the imagination and the competence to get the children to use them properly. The Education Commission (1956) had echoed this in their report when they said that, of all the different factors that influence the quality of education and its contribution to national development, the quality, competence and character of teachers are undoubtedly the most significant. The Secondary Education Commission (1954) were also convinced that the most important factor in the contemplated educational reconstruction was the teacher—his personal qualities, his educational qualifications, his professional training and the place he occupies in the school as well as in the community. They felt that the reputation of a school and its influence on the life of the community is invariably determined by the kind of teachers working in it. We may, therefore, restate the obvious fact that the teacher is the kingpin in any education system. Indeed, no education system can rise above the level of its teachers.

As things stand today, the teacher occupies the centre of the stage in the grand opera of learning in India. The schools here are organised to provide learning only through formal teaching by teachers. As such, schooling has become a proxy for education. Learning and education are mistaken to be synonymous. At least the teacher is expected to make them so and would like us to believe them to be so. Unfortunately, although there are learning theories galore, we have only an imperfect and incomplete understanding of the process of learning. Very little is truly known about how people learn, the environmental conditions most conducive to learning, why so much of what is learned is so quickly forgotten, or why some children learn while others fail to do so. A technique for converting learning into education is a veritable missing link. These information gaps make schools particularly vulnerable to quackery and resort to instant cures, which only compound the ailment. They make the teacher the most important person in creating situations for learning and therefore for education. The difference between quackery and a real remedy is the knowledge and expertise of the teacher. He is the vendor of all educational concoctions and, interestingly, he has captive customers for his nostrums. What is needed in this situation is a professional teacher not a quack, a person who knows intuitively or otherwise how to convert learning in schools into real education.

Besides the gaps in learning theories, there is another challenge to be met by the teachers today—that of informatics. Teachers earn their livelihood by selling knowledge to others, as do the doctors, lawyers, engineers and architects. They, however, constitute the largest single group dealing in knowledge. The trend is still towards an increase in the number of teachers. It may, however, go into reverse before too long as knowledge and information, even of the professional kind, become available from machines controlled by microprocessors. If the storing and communication of information are going to be transformed in the very near future, so that young people, confident in the handling of new technology, can have access to almost any knowledge they are likely to need within their homes, the *raison d'etre* for the kind of teaching in schools that is concerned with the transmission of knowledge will be seriously challenged. This, however, does not imply that the teacher will become redundant but that a new kind of teacher will be needed. All that it means is that didactic teaching on its own will be superfluous. The job of teachers in the schools of the future will be concerned much more with the attitudes of learners and with stimulating in them a spirit of enquiry and desire to gain knowledge and skills that can enrich their lives.

It is in the context of the problems of the present and challenges of the future that the present paper puts forward the thesis that the best way of ensuring quality of education in India is to enhance the professionalisation of teaching. This has never been taken into consideration in educational planning to the extent it deserves. The important distinction which needs to be made is between teaching *per se* and teaching as a profession. It is a well known fact that people teach their dogs to walk to heel, their friends to play card tricks and their children to make daisy chains without thereby necessarily contributing in any way to their education.This kind of teaching can, at the most, be called training. The relevant connection is not therefore between teaching *per se* and education, but between teaching as a profession and education. In other words, it is the professional teachers who change learning into education.

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To make fine distinctions between the terms occupation, vocation and profession may not be easy. Occupation is a fairly general term meaning a particular action or course of action in which one is engaged. It also signifies the principal business of one's life. Vocation has a similar meaning and denotes the work in which a person is regularly employed. It would generally involve some skills. While occupation and vocation may be used interchangeably, profession has come to mean much more than these terms. Few words are, however, so loosely used as profession. In a very general way we may agree that "a profession may perhaps be defined as an occupation based upon specialised study and training, the purpose of which is to supply skilled service or advice to others for a definite fee or salary". (A.M. Carr-Saunders, p. 31) It is a vocation in which a professed knowledge of some department of learning is used in its application to the affairs of others, or in the practice of an art founded upon it. Almost every specialised group, as soon as its members can claim to offer a significant service to society, begins to identify itself as a profession. What were only new occupations a few years ago are now fully recognised professions, and new professions are emerging at an accelerated rate. Let us, therefore, examine the meaning of the word profession a bit more closely.

It is worthwhile to point out that a profession is a social phenomenon—a complex kind of social phenomenon at that. But an important characteristic of any social phenomenon is the dimension of meaning. Consequently, it must be understood rather than be straight-forwardly observed. *Inter alia,* a profession, therefore, owes its existence to the perception by its members of their membership and, additionally, to its recognition as a profession by the rest of the community. In this sense, while speaking of a group of people as forming a profession, we are speaking about how they see themselves and are seen by others.

Besides the above-mentioned sociological aspect, we may list the following important characteristics of a group that may be said to constitute a profession:

1. It is a body of specialised knowledge based on theory which is the basis of the work of the group.
2. Entry into it requires a process of fairly long formal training in an educationally communicable technique.
3. It has a procedure for certifying or validating the membership of the profession.
4. It has a set of standards of performance—intellectual, practical and ethical. This code of conduct is defined and enforced by its members themselves.
5. Working increasingly towards altruistic objectives, it calls for a life-long commitment on the part of its members, sustained by social and economic norms.
6. It has a tendency towards self-organisation, with a body of members representing the entire corps doing professional thinking, controlling norms and advising in all professional matters. This also implies a broad range of autonomy for both the individual practitioners and for the occupational group as a whole.

Obviously professionalisation is not dichotomous. It is a continuum in which different groups may be professionalised to different levels, depending on the extent to which they satisfy the above criteria.

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Let us, first of all, see whether teaching qualifies to be a profession as a social phenomenon by being perceived by others as such. Measured in terms of numbers, teaching is undoubtedly the world's largest group engaged in any vocation. There are said to be 20 million teachers throughout the world. A stereotype of this group that does seem to be true for most, though not all, countries in the contemporary world is that it is a woman's vocation. There is a preponderance of women teachers, particularly at the elementary level. Of the 20 million teachers, a rough estimate is that two-thirds are women. India seems to be somewhat different. Here, the total number of teachers at the school stage, according to the Fourth All-India Educational Survey, is nearly 3 million. Only about 27 per cent of them are women.

The perception of teachers by others depends on the roles that the 20 million of them are playing as participants in community affairs. Broadly speaking, the function of a teacher is to help the client learn things, by imparting knowledge to him and by setting up a situation in which the client can and will learn effectively. But while performing this function, he also interacts with the community. The teacher, therefore, fills a complex set of roles, which vary from one community to another and from one educational level to another. Some of these roles are performed in the school or university, and some are performed in the community. The roles required to be played in the school or university are: mediator of learning; disciplinarian or controller of student behaviour; parent substitute; confidant of students; judge of achievement; organiser of curriculum; bureaucrat; scholar and research specialist; and member of teachers' organisation. Roles which are prominently played in the community are: public servant; surrogate guardian of middle-class morality; expert in some areas of knowledge or skill; community leader; and agent of social change. In general, in the smaller communities, teachers fill leading roles in community organisations and activities. In large urban centres, where there is greater competition for leadership, they are not so prominent in community affairs. University and college teachers are able to play some of the roles more effectively than school teachers especially as scholars and research specialists, as community leaders and as agents of social change. That is why, in spite of their being untrained, they are respected better as professionals than school teachers.

There is also a two-way link between the level of professionalisation and social status. Teachers throughout the world, but more so in India, have been cribbing for better social status, including better emoluments. The Government of India had set up two National Commissions of Teachers to look into all the problems of teaching and teachers and to recommend ways and means of improving their working conditions and status. How far their recommendations will be able to strengthen the link between social status and professionalisation is a matter of conjecture. As a generalisation, it appears that prestige rank in the public mind is in this order: college teacher, high school teacher, primary school teacher. With the growth of urbanisation and consequent removal of the teacher from close, day-to-day contact with parents, the extent of regard in which teachers are held has become increasingly difficult to pinpoint. There are, to be sure, constant pronouncements about the indispensability and importance of teachers in our society, but these pronouncements find all too little substantiation in public policy.

One thing seems to be clear that school teachers in India have developed a social stereotype in contradistinction to university teachers and other professional groups. School teaching is often seen as a refuge for mediocre people who are industrious but unimaginative and uncreative, lacking independence and social courage but with lot of love for children. The ordinary school teacher has little of the personal weight, of the sense of professional responsibility, of what may be called the corporate self-respect of the lawyer, the physician or the engineer. The traditions of the teaching guild do not yet demand a wide education, a slow and laborious preparation, a careful and humble apprenticeship, such as are required for entrance into the really learned professions. It is, therefore, not surprising that persons who are supposed to look after education do not always come from the traditionally educated classes. They are generally first generation graduates, the rural educated, those looking for social mobility just on the basis of their education, except sometimes for women who belong to highly educated families but nevertheless take to teaching because of the facilities of long vacations and short working hours which enable them to accommodate their responsibilities in their second occupation—running a home. Also, current social norms hold that teaching is a fully acceptable occupation for women of all classes. As regards men, it is interesting to note a peculiar phenomenon which has manifested itself in India over the last forty years or so. Before Independence, urban educated persons used to go to rural areas as teachers. But nowadays, persons of rural origin are taking up teaching jobs in urban schools. The reason is obvious. The urban educated have better jobs to look for. School teachers still continue to be underpaid, always finding it difficult to make both ends meet. Teaching presents a relatively unstaged career. Once a teacher, always a teacher. Promotional avenues are limited. They consider themselves a neglected lot. One of their festering grievances, which has sometimes been the cause of strikes, relates to avenues of promotion. Young IAS entrants, commissioned officers in the army, recruits in the banking services or engineers in state electricity boards are able to get quick promotions, while stagnation stares teachers in the face.

In relation to other characteristics of a profession, teaching has come a long way. Enough legal and academic steps have been taken to professionalise teaching. The qualifications required of teachers fall under three heads: content or subject matter, pedagogy and education—required in different combinations.

Qualifications in terms of content have been going up in recent years. For example, about 25 years ago any second class postgraduate could dream of becoming a university or college lecturer. But now, with the revision of pay scales, the minimum qualifications for lecturers have risen to Ph.D. Similarly, about fifty years ago, many primary teachers were not even matriculates. But now no one can think of becoming a primary teacher without passing the SSLC examination followed by one or two years' training. This cannot be dismissed entirely as inflation in qualifications, which it may partly be. It definitely enhances the level of professionalisation of teaching.

Coming to pedagogy and education, they are taken care of by training colleges, both for primary and secondary teachers. Pedagogy has emerged as a specialised discipline and training courses for teachers in this discipline have been devised, leading to certification. The cold war between the pedant and pedagogue seems to have been won by the latter at the school stage. Minimum qualifications, insisting upon training, have been laid down by State Education Departments. According to the Fourth All-India Educational Survey, among the teachers at the primary stage, 86.7 per cent are trained. Manipur, Meghalaya, Nagaland, West Bengal and Arunachal Pradesh, however, have a substantial backlog of untrained primary teachers. Similarly, at the middle stage, 86.67 per cent of the teachers are trained. At this stage, Meghalaya has the highest percentage (81.80) of untrained teachers. In Assam, Manipur, Meghalaya, Nagaland, Sikkim and Mizoram, more than 50 per cent of the teachers are untrained. At the secondary stage, 87.50 per cent of the teachers are trained. In Assam, Manipur, Meghalaya, Nagaland and Mizoram, untrained teachers out-number the trained ones.

These developments have given teaching the semblance of a profession. But more concerted efforts of educational reformers, government planners and teachers organisations are required to fashion teaching into a full-fledged profession. Some criteria yet remain to be fulfilled. A teacher may remain a teacher for the whole of his life, but he is yet to develop a life-long commitment to his work. Powerful teachers organisations with a responsibility for maintaining and improving academic standards are yet to come into being. We may, therefore, say that the level of professionalisation of teaching has increased recently but is not yet more than a semi-profession.

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The evolution of teaching as a semi-profession has come about through the ups and downs of history. One may take the view that in ancient India teaching had the status of a profession, at least as a social phenomenon. It was frozen into the highest echelons of the caste-system. This continued well-nigh into the Middle Ages. The majority of the teachers were Brahmins who were attached to the profession more by the respectability which tradition gave to it rather than by considerations of actual gains in cash or kind. The school master of the time could claim certain privileges from the community which compensated, to not a small extent, for the smallness of his earning. He was entirely a man of the people whose children he taught. He was always remembered in the hearts and at the hearths of the people. He was invariably invited to all great dinners and would receive presents on important festivals.

With the coming of the British, the situation started changing fast. Although social stratification did not break down completely, a trend towards embourgeoisment of society got under way. The indigenous system of education started transforming itself. It was being increasingly patterned on the 19th century education system in Europe which had been developed to meet the recognised need for universal literacy in an industrialising society. The requirement of teachers went up steeply. Obviously they could not all be drawn from the highest caste. This necessitated a greater degree of secularisation of the teaching profession. Furthermore, the education system itself was not in a position to maintain an adequate supply of qualified teachers. So indifferently trained persons became acceptable as teachers. There was also a feeling that teaching at the primary level was no more than a high-level domestic service in which the teacher took over some of the child-rearing responsibility of the family. The teachers who taught in the common elementary schools of the time were required to teach the rudiments of the three Rs. Knowledge of multiplication and other tables was essential to every teacher; but beyond that, a tolerably good handwriting and an ability to read simple writing formed the minimum attainments of a common schoolmaster. That is why it was felt that masters were ignorant and, in fact, as regards to knowledge to be gained from books, they had as much to learn as the boys themselves. Thus, when the support of social stratification became weak and scholastic requirements were pitched low, it was but natural that teachers should lose in social status and professionalism.

Recent changes in the social, economic and family structure of society have, however, decreed the necessity of higher levels of education for all our people. The need for better qualified and trained teachers has been clearly recognised for quite some time now. The Calcutta University Commission (1917-19) had argued that the output of trained teachers should be substantially increased; that departments of education should be created in the universities of Dacca and Calcutta; and that education should be included as a subject for the Intermediate, B.A. and M.A. degree examinations. This has now been implemented by almost all the universities in India. Schools and schooling have assumed a more significant meaning in society. The extension of schooling to 12 years, the enriched school curriculum in general, and the desire for higher education, have created a demand for professional teachers. Consequently, as pointed out earlier, teaching is becoming more and more professionalised, but is yet a long way from its goal.

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The frightening inadequacy of grounds for recognising teaching as a profession arises from history and tradition. A number of factors continue to impede the level of professionalisation, which we will now describe briefly.

The low preparation and admission requirements which have obtained since the founding of the present education system, and which still persist in most of the states, have helped to implant in the public mind an image of inferiority and ineptness. The importance of a profession in the public mind is directly proportional to the difficulty in entering it. Compare, for example, how difficult it is to enter a medical or an engineering college with how easy it is to enter a training college for education. But then the rush for entry depends upon the status and privileges enjoyed by the entrants after passing out.

Probably the greatest single obstacle to the achievement of professional status and recognition has been the inferior role accorded to primary school teachers. Traditionally, the public thought they needed to know only a little more than the little children they taught. Even the teaching profession itself accepted or acquiesced in this notion until recent years. As mentioned earlier, some fifty years back, even an under-matriculate with almost no educational training could think of becoming a primary school teacher in India. How far, then, can one really go in laying down higher qualifications for this job in our vast country?

The socio-economic status of teachers has been a matter of concern to all those seeking an enhancement in the level of their professionalisation. As the Education Commission (1966) put it:

> The efficiency of the teaching profession and its contribution to national development in general and educational improvement in particular will depend largely on its social status and morale. This will, in turn, depend upon two inter-related factors: economic status and civic rights of teachers and their professional competence, character and sense of dedication. Throughout the world, the general experience has been that, as the material rewards of teachers are elevated, it becomes possible to recruit into the profession individuals of a continually improving quality and with more extended professional training; and in proportion as the competence, integrity and dedication of teachers increased, society has been increasingly willing—and justifiably so—to give greater recognition to their material and economic status. We visualise a similar development in India over the next 20 years. [p. 115.]

The twenty-year period is almost over and one may vouch for the trend already having set in, but a lot still needs to be done to improve the socio-economic status of teachers if teaching is to assume the status of a full-fledged profession. The hard fact of life is that no male teacher can make both ends meet with just the salary he gets. He is forced to supplement his income at the cost of professionalism. Women teachers supplement it indirectly by looking after their homes. Indeed, most teachers are only part-time teachers, unlike other professionals.

Teaching differs fundamentally from the other professions in that teachers are always employees who can be driven out of the profession by dismissal. Members of other professions, since they can be self-employed, can be driven out only by cancellation of their licences. No one seems to have recognised the importance of self-employed teachers for the society in general and for the professionalisation of teaching in particular. Self-employment is often the mark of a pucca profession. A doctor can be self-employed; so can an engineer or a lawyer, but not a teacher. This lack of self-employment opportunities is a hurdle in the way of professionalisation. The author is aware of the likely criticism to the suggestion that teachers should be encouraged to take up self-employment, in that it will lead to commercialisation of education and will lower the prestige of the noble profession. But this can perhaps be controlled by professional organisations of teachers.

If professionalisation of teaching is to be completed in India, teachers' organisations will have to wrest the academic initiative from administrative organisations. They should play the major role in any educational innovation, but especially in improvement in syllabuses, textbooks, examinations and teaching methods. If these improvements start taking place at the initiative of teachers' organisations, the teaching profession will come of age. In all parts of the world such organisations have followed, or are following an almost identical pattern of growth—starting as trade unions designed to fight for material benefits and gradually becoming bodies concerned with many aspects of their members' lives. In India, most of them are currently engaged in securing better salaries and conditions of service for teachers. But some of them have already started academic programmes. They are conducting research, organising inservice education and are producing literature needed by teachers. They should also establish a professional code of conduct and ensure that it is followed by all members.

But much of the urge for professionalisation should come from individual teachers. It is a matter of acquiring and adhering to professional values—a sort of self-imposed code of conduct. These professional values among teachers contribute significantly towards teaching effectiveness. Recent research (Gupta and Kapoor, 1983) has attempted to grade teachers on a scale of professional values like sincerity, attachment, propensity to accept new challenges, propensity to research, and professional drive. It was found that teachers at the secondary stage are deplorably low on attachment, propensity to accept new challenges and propensity to research. Lack of professional attachment implies accidental entry to the profession and a low level of involvement, enjoyment and satisfaction in teaching. Propensity to accept new challenges and propensity to research have been found at low ebb, as reflected by lack of innovativeness and absence of an urge for reading and writing. However, teachers have shown a high degree of sincerity. They have also been found to have some degree of professional drive, i.e., an urge for professional orientation, and participation in professional programmes for amelioration of their professional standards. Interestingly, it has been found that the older and younger teachers have higher professional values as compared to the middle-aged group.

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In sum, if one is looking for a one-point programme for the improvement of education, one can boldly say that it must consist of making teaching a profession and all teachers professionals in the full sense of these terms and getting them recognised as such. The time has therefore come to take urgent steps to remove the impediments to this development discussed above and bring teaching to the level of a full-fledged profession.

But it is not as simple as it may appear on casual analysis. What is needed is to consolidate the existing trends towards professionalisation of teaching by laying down rigorous intellectual standards, as also a code of ethics for teachers, besides, of course, improving pedagogy, its theory and practice. But more than that, the society should be in a position to inculcate a life-long commitment among members of the teaching profession. Unless teachers stop looking for other jobs and have a commitment to teaching and nothing else, they will not entitle themselves to being called professionals. They had therefore, better stop the constant demand for commiseration, and should concentrate more upon the opportunities, the privileges, the obligations, the social service, and the productive career that lie ahead in teaching for young people. With the tremendous upsurge in enrolments which faces us, with the consequent increase in teaching, administrative and supervisory positions, the sky is the limit in terms of opportunities for young people who want to spend their lives fruitfully. This is not to suggest that they should be oblivious to mundane things like working conditions, scales of pay and retirement benefits.

According to the Education Commission (1966), in the post-Independence period, continuous efforts have been made to improve the remuneration of teachers at all levels. But the net results achieved have not been adequate. A good deal of the effect of increases has been offset at all stages by increases in the cost of living. In some cases, there has been an actual decrease in remuneration in real terms. It cannot, therefore, be denied that, while appealing to the conscience of teachers to improve professionally, the time has also come to improve their status by drastic improvement in salary scales, service conditions, fringe and retirement benefits as also by providing adequate promotional avenues.

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PREM KIRPAL

Toward an Education for the 21st Century

Prem Kirpal

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Toward an Education for the 21st Century

THE GLOBAL PROSPECTS OF EDUCATION FOR THE 21ST CENTURY already touch all continents and societies, and will surely acquire more relevance and meaning through the two decades ahead. Educational ideas and practices are increasingly shared by peoples and nations at different levels of development and inheriting diverse traditions. Education is no longer confined to national realities and horizons; beyond these boundaries of the past new global vistas appear rapidly and make education more and more a human concern confronting common problems and offering opportunities to all. New dimensions of time and space projected by the march of science and technological developments, especially the revolution of communication systems, have brought peoples closer to each other in thought, action and aspirations. The interdependence of nations goes far beyond the structure of economy and communications. The human predicament is shared by all, and both survival and development depend upon cooperation among peoples and nations. International education is seen more and more as the best instrument of building that moral and human solidarity without which mankind cannot solve the emerging global problems and man cannot cope with the problems of living together happily and creatively.

The education of humanity for the 21st century will evolve in the context of global problems that are already with us. A brief reference to some of the major problems is necessary to understand the context of international education and the directions of its growth. What are these emerging global problems?

Among the major concerns of mankind projecting increasingly into the future, there are three great explosions of accelerated development, three crucial issues contending for mastery, three deep conflicts requiring peaceful resolution and balanced synthesis and three poignant gaps portending grave dangers and fateful challenges. Some of these twelve problems have plagued several civilisations of the past, but in the 21st century they can threaten the entire humanity and consequently call for global efforts to overcome the evil and nurture the good implicit in the choices and solutions they may be offered and taken. I refer briefly to these problems which are familiar to educated people everywhere although their impact and response vary strikingly in the context of cultural diversity and the heritage of traditions.

Explosion of population

The rapid increase of population, especially in the developing countries, where poverty rages and spreads fast, poses a stupendous problem to both development and quality of life. Even if the policies and measures of population-control and family-planning succeed dramatically, of which there is little hope, a massive increase in the 21st century is inevitable. The spread of relevant and meaningful education and the raising of living standards are essential for any appreciable control of the population explosion, but so far there are no signs of success in the battle against poverty and ignorance, no evidence even of an adequate spirit of urgency and meaningful action in these fields. Unless some catastrophe intervenes, the doubling of the world population will be a fact of life early in the 21st century, with the greatest pressures on the meagre resources of the poorest and the most deprived of peoples and affecting the life-styles of all.

Explosion of knowledge

To some extent the coming flood of humanity could be taken care of by the application of knowledge, especially the fruits of science and technology. Man will exploit the oceans and explore space for both adventure and wealth, driven compulsively by sheer necessity. But the rate at which knowledge has increased recently and the galloping trends ahead point to a knowledge explosion which may prove disastrous if the power of the mind is directed to the pursuit of wrong ends and harmful, perverted values. The man of the next century will need ample morality and creativity to regulate and harness the power of knowledge for human welfare; of this the portents are not bright.

Explosion of expectations

The unbridled growth of population and new knowledge, especially in the form of technology, leads to another type of explosion, even more dangerous and powerful because it takes place in the minds of men and takes the form of desire and greed, aggression and consumerism. The revolution in communications generates images and urges among the masses to ape the life-styles of the affluent elite. It gives rise to expectations that cannot be fulfilled universally and may even distort established patterns of life. The forces of democratisation feed such expectations and their pursuit often undermines true democracy and debases culture. The urge to change for the betterment of life and improvement of individual personality is good and commendable, indeed essential for development. But the uncontrolled flood of expectations gives rise to actions and values that may counter the quality of life and the fruits of development. Can we spread true awareness and strong will for disciplined action among the masses of people to ensure their participation in the process of development instead of the mindless pursuit of desire and expectation which generates selfishness and greed? The explosion of expectations needs to be harnessed for the good of man and his humanity. There is growing evidence to project the increase of crime along with striking gains of economic development—a matter of concern to all countries.

More urgent and crucial than the three general explosions of population, knowledge and expectations are some concrete and contending forces that affect the survival and health of our present-day civilisation.

Issue of war and peace

Among these fateful issues the question of war or peace is no longer an academic concern in the context of the continuation of man's wayward history. The power of armaments that already exists and their potentials of deadly destruction are grave threats to the survival of civilisation, indeed of life itself. The might of weaponry has always been deployed in the past for expanding national territories and building empires. Is there any guarantee that resort to war will now cease owing to the certainty of its deadly consequences? The task of constructing the defences of peace in the minds of men has been proclaimed in the 20th century. Will the man of the 21st century succeed in building some impregnable defences? The issue of war and peace hangs perilously in the balance and leads to the quest for a new type and content of education which seems to call for nothing short of man's spiritual transformation and transcendence to a creature and a consciousness unknown in the past.

Issue of man and environment

Equally alarming is man's growing plunder of his environment and nature, expanding finite resources on a scale and at a speed which threaten disaster to the earth's ecological balance, and even of the biosphere which sustains life on our tiny planet. Measures for protection of nature, care of the environment, and stoppage of pollution are sorely needed. The pillage of forests and pollution of the oceans call for urgent and effective measures for conservation of precious resources. Some constraints on the exploitation of technological power are necessary.

Culture and technology

The rapid advances of technology in the wake of the Industrial Revolution and the explosion of scientific knowledge pose a challenge to culture. No doubt technology can enrich the culture of a people and basically there is no contradiction between the deployment of technology and the enjoyment of culture. The problem arises from a sudden loss of balance and integration of culture with the onslaughts of technology and its invasion of predominantly cultural experiences and human relations. Consequently, culture is commercialised and dehumanised and man becomes a slave of his own technology.

The resulting distortion of life's balance leads to serious conflicts that plague living and the ordering of society.

Conflict between the inner man and the outer world

The most serious of the present-day conflicts is the growing alienation of man from his work and his society, resulting in the loss of established moorings and familiar support of human relationships. At a deeper level, this can be experienced as the difficulty of reconciling science with spirituality. They are not irreconcilable, but the effort calls for better education and a richer and more harmonious cultural life.

Individual freedom and social organisation

Another consequence of industrialisation and urbanisation is the enormous complexity of social organisation which threatens the scope of the individual's choice and his participation in the life of the community. Mechanisation and totalitarianism advance at the expense of man's integrity and human freedom.

Tradition and modernity

The rapidity of change and the speed and scale of scientific and technical innovation threaten to obliterate traditions which have sustained the faith and rootedness of man and given meaning to the quality of his life.

The developments, conflicts and problems outlined above assume serious proportions from the persistence of certain gaps in the functioning of society and the making of personality.

Gap between developed and developing countries

The foremost of these gaps is the one that separates about 30 per cent of mankind living in some material affluence from the rest, the 70 per cent condemned to persisting poverty and deprivation of basic living standards. The gap grows wider and we become poignantly conscious of the fantastic achievements of science and technology along with the persistence of poverty and wretchedness among the vast majority of human beings living in the so called developing countries. The lot of the poor is worsened by the loss of traditional moorings and the gradual warping of precious human relations. Their cultures are threatened by the power and glamour of alien models of material development. Demands of social justice, equality, humanity and human solidarity cannot be met without bridging the gap between the rich and the poor, the haves and the have-nots at both levels of international relations and national realities. International cooperation and human benevolence need to be directed to the emerging global task of reducing this gap. This again depends upon the effectiveness of some form of international education for the 21st century.

Gap between knowledge and wisdom

The education of the future must not only disseminate knowledge, but even create more and more knowledge. It should also aim at developing conditions for the upsurge of wisdom and its application to the art of living. Man must be himself, know himself and try to transcend himself, and attain heights of awareness and creativity which have hitherto been attained only by a few saints, seers and elites of the past.

Gap between power and love

The final transcendence cannot be achieved without transmuting power into love, for which the first step is the true understanding and conscious harnessing of the self for service to others and for love of one's fellow-beings. Such a transformation of the nature of man's functioning and his operational values must be the most important aim of education for the future. Such an education has to be evolved from an endeavour to meet the real problems and conditions forming the human predicament of our time and to mould a new future yet to be born.

For any worthwhile reflection on the nature and content of education for the 21st century, it is necessary to understand the emerging problems of life and society which will be with us for many decades and to which the succeeding generations will have to respond, and, in the process of such response, shape their educational systems. Many of the problems I have briefly touched upon have been experienced in the past, but their intensity, scale and significance acquire a new meaning now and they are rapidly evolving for the men and women of the next century. It is also clear that the scope of education continues to extend in time and space, comprehending the whole span of life for the overall integration of human personality and the quest of a larger awareness which can serve the emerging needs of man as a worker, as a citizen, as a person and even a creator. The entire globe and the endless spaces beyond enter man's concerns and his new consciousness confers upon him the role of a creator who can understand and increasingly direct his own destiny and the process of evolution. The life-long span of education, the multiplicity of its avenues, the primacy of the learner, the choice of new technologies of communication, appropriate educational materials and learning situations, all these unfold a scenario of education which will be entirely new, especially in its scope and range. What will be the purpose and role of education in the 21st century?

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It is clear that the education of the future will evolve in the context of a planetary civilisation, shaped largely by the fruits of science, the infrastructure of technology, and the flow of ideas and images on a scale without any precedent in the past. The planetary civilisation will reflect five major concerns and trends, to which I refer briefly in the following paragraphs.

Diversity of cultures

Within the external uniformity of the planetary civilisation the diversity of cultures will grow and flower, and afford to people a sense of belonging and rootedness and a real possibility of participation in the cultural life of their communities. The identity of groups and nations will be increasingly expressed in their cultural life while global tasks and structures will grow in extent and importance. The emergence of a universal culture is neither likely nor desirable. In fact there will be a tendency for the cultural groups to grow in number, along with the institutions and tasks of planetary management.

Decentralisation of power

This trend will be accomplished by greater decentralisation of power. Concentrated centres of power can neither manage efficiently nor afford freedom and participation to people which will be essential for richer productivity and better quality of life.

Quality of life for all

The richness and expression of cultural diversity reflected in closely integrated communities can be the basis of quality of life for all, which should be the goal of development. From its own cherished roots in the past and its aspirations and ideals for the future, each cultural group will seek its quality of life, rejecting thereby the present obsession with the pursuit of a single, dominant Western model of development which projects largely the acquisition of material wealth for consumption and greed. The content of life's quality will depend upon the choice and practice of cultural values by various societies and individuals.

Sense of human solidarity

Appropriate cultural values for each society will include a set of human values common to all cultures. The spread of human values will enrich distinctive cultures and also strengthen the sense of human solidarity upon which a strong and viable system of international cooperation can develop.

A New World Order

Such cooperation will advance justice and equitable distribution of wealth, giving rise to a New World Order for the global tasks of a planetary civilisation and the careful nurturing of diverse and autonomous cultures. The transformation of the existing United Nations system into a New World Order, promoting human solidarity and quality of life and respecting diversity of cultures and decentralisation of power, is already vaguely sought and will soon become a more conscious, systematic and deliberate objective. The education of the future will evolve in the context of this transformation and also facilitate its far-reaching changes.

Objectives of education for the 21st century

What should be the role and objectives of education for the next century which will see the rise of the planetary civilisation and a New World Order—more just, humane and harmonious, respecting the dignity and sanctity of human personality and contributing to the advancement of liberty, equality and fraternity in the functioning of society?

The great change that I visualise is the primacy of culture in the life of man. Patterns of development will stress culture and its enjoyment and creation in all societies. In the post-industrial age the rich nations must fill their leisure and regulate their consumption of material wealth by greater pursuit of the things of the mind and the spirit. For the poor, their cultural life will help people's participation in the developmental process, strengthen national integration and cultural identity, and afford a quality of life not exclusively dependent on material affluence. For both the rich and the poor of the world, culture and cultural values will be the source of cooperation upon which peace, welfare and life's quality can emerge and thrive. If the 20th century has been a century of economy and material expansion, the 21st century may herald the primacy of culture and stress upon man's inner life and spirituality.

The present systems of education have been moulded in the experience of the industrial revolution of material success, monetary profit, acquisitive competition and national ambitions; the education of the future must be devised for attainment of a higher quality of life and greater cooperation among nations and cultures. The present concept of mankind will move from its realm of abstraction to the tangible reality of the planetary civilisation. We should now recognise the importance of what is described as international education and give it the priority that it deserves.

For the emerging trends to blossom into a new concept and system of education in the 21st century the foundations must be laid now and new directions sought and pursued. Unesco's report entitled 'Learning ToBe', presented by an International Commission on the Development of Education under the chairmanship of Edgar Faure suggests to national governments three basic tasks and strategies for transformation. These are as follows:

(1) Governments should initiate a fundamental reshaping of national educational systems and participate in a global diagnosis of the education and training systems. In the present state of affairs, educators must enquire into the profound meaning of education for the contemporary world and reassess its responsibilities towards the present generation which it must prepare for tomorrow's world. The commission expresses the hope that national authorities will "recognise the primordial necessity of placing educational problems in an overall context, and seek answers to this all-important question—Does the educational apparatus, as now conceived, really satisfy the needs and aspirations of man and societies in our time?"

(2) National authorities should undertake a deeper scrutiny and understanding of the educational life of their societies and probe far beyond the previous trends of being mainly concerned with quantitative and qualitative aspects of education.

In the past our main concern has been to do more than before, and later on, better than before. We must now ask ourselves how to do different than before, because what was adequate before is no longer either suitable or relevant. To quote the Commission:

> Education is such a huge undertaking, it has so radical an influence on man's destiny, that it will be damaging if it is only considered in terms of structures, logistical means and processes. The very substance of education, its essential relationship to man and his development, its interaction with the environment as both product and factor of society must all be deeply scruitinised and extensively reconsidered.

(3) National authorities should reshape their educational system on two parallel lines: (i) internal reforms and continued improvements of existing educational systems, and (ii) search for innovative forms, for alternatives and fresh resources.

The Commission observes rightly:

> It is no longer desirable to undertake educational reforms in piecemeal fashion, without a concept of the totality of the goals and modes of the educational process. To find out how to reshape its component parts, one must have a vision of the whole . . . We must think clearly in exploring new paths for the future . . . This search for practical alternatives as parts of a genuine strategy of innovation seems to us to be one of the primary tasks of any educational undertaking.

From these broad directions of educational change, to be launched as soon as possible, the world community must move to the heart of the matter which is the full development of human personality by all the means and modalities available, and in particular the promotion of understanding, tolerance and friendship among all nations and racial and religious groups, and the strengthening of international solidarity and cooperation. The ways and means of achieving these ends are clearly formulated in Unesco's recommendation concerning Education for International Understanding, Cooperation and Peace adopted by the General Conference at its eighteenth session in November 1974. The recommendation lists the following objectives as major guiding principles of educational policy:

(1) an international discussion and a global perspective in education at all levels and in all its forms;

(2) understanding and respect for all peoples, their cultures, civilisation, values and ways of life, including domestic, ethnic cultures and cultures of other nations;

(3) awareness of the increasing global interdependence between peoples and nations;

(4) ability to communicate with others;

(5) awareness not only of the rights, but also of the duties incumbent upon individuals, social groups and nations towards each other;

(6) understanding of the necessity for international solidarity and cooperation; and

(7) readiness on the part of the individual to participate in solving the problems of his community, his country and the world at large.

Expanding on this the recommendation said:

> Combining learning, training, information and action, international education should further the appropriate intellectual and emotional development of the individual. It should develop a sense of social responsibility and of solidarity with less privileged groups and should lead to observance of the principles of equality in everyday conduct. It should also help to develop qualities, aptitudes and abilities which enable the individual to acquire a critical understanding of problems at the national and the international level; to understand and explain facts, opinions and ideas, to work in a group; to accept and participate in free discussions; to observe the elementary rules of procedure applicable to any discussion; and to base value-judgments and decision on a rational analysis of relevant facts and factors.

In this context I also recall the following words of the great educator, Jean Piaget, whom the world of education lost recently:

> The principal goal of education is to create men who are capable of doing new things, not simply of repeating what other generations have done—men, who are creative, inventive and discoverers. The second goal of education is to form minds which can be critical, can verify, and not accept everything they are offered. The great danger today is of slogans, collective opinions, ready-made trends of thought. We have to be able to resist individually, to criticise, to distinguish between what is proven and what is not.

The statements quoted above reveal pathways to the 21st century when a spiritual dimension of life will enter the vast domain and process of life-long education, determining the primacy and content of culture and recognising the inculcation of human and cultural values as the essence of education. We shall witness a transition from 'Learning to Be' to 'Learning to Become', and in this adventure of transcendence the cultural and spiritual traditions of Asian countries, enriched by the insights of modern science and the choice of beneficent technologies, can play a significant role.

The becoming of man in the 21st century from integral education and luminous culture will signify a leap forward in human consciousness, so well described in the writings of the Indian sage, Sri Aurobindo, for whom the chief aim of education is "to help the growing soul to draw out that in itself which is best and make it perfect for a noble use". The union of science and spirituality in a new awareness of man's psyche and his emerging cosmos will be the achievement of education in the next century.

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Education, in the broadest sense, including the new concept of life-long education, is the most potent force in the shaping of values, the harmonisation of the forces of tradition and innovation, and the emergence of a modern society through a dynamic process of the renewal and adaptation of traditional knowledge and wisdom, especially in the developing world. The experience of India in educational thinking, planning and implementation after Independence, with all the difficulties and failures as well as some significant opportunities and successes, is specially relevant. While the role of teachers, the content of the curriculum and the nature and effectiveness of cocurricular activities, wield powerful influence on the moulding of values, one must also take into account the responsibility of the parents, the opportunities of participation in the cultural life of the community, the effectiveness of the media of mass communication, and the use of solitude. Both the peace of yoga and the speed of electronics are relevant for learning from the inner psyche and the outer world.

The new tasks and challenges in the field of education which India has to face arise out of the legacy from the immediate past of the colonial period, the ideals fostered by the struggle for freedom and independence, and the ancient traditions of the past now in the process of scrutiny and renewal. The plans and efforts for the reconstruction of the educational system in India have to be examined and evaluated in this context. The goals of modernisation in education are to be related both to the social needs of the emerging society and the fulfilment of the individual person in his work and fellowship with others as well as his search for inner balance, harmony and vision.

The gap between thought and action, ideals and reality, plans and implementation in the field of education is wide everywhere, but it is specially large and poignant in our own country, confronting as it does numerous tasks and problems with a glaring paucity of resources and means of action. The choice of objectives and priorities, therefore, assumes great importance along with the modalities of effective implementation.

For India a great renewal of education holds the key to the opening of a new future of moral and material development. Such a renewal depends upon the wise charting of a course of action to initiate the basic changes needed. The first step is to formulate certain principles to guide policy-making and planning in the field of education. I suggest ten such principles for a profound renewal and transformation of education:

1. We must comprehend the nature, role and process of education relevant to our contemporary situation, carrying the burdens of its past and looking ahead to the emerging future, which must be largely of our own choice and our own making. This calls for clear and creative thinking, liberated

from the slogans and rhetoric of the past. *Think hard and shun rhetoric.*

2. We should now conceive education in the broadest sense, touching upon all important concerns of society, functioning as the most important agent of change and providing lifelong learning for the needs, capacities and choices of the learner. *Education is synonymous with life.*
3. While the State has a paramount role and the political will for education is often decisive, the content, the quality and the use of education depend upon participation of people through meaningful cooperation of appropriate institutions of society and fruitful linkage of developmental activities in the process of change. The world of learning is comprised of the worlds of knowledge, of culture and of work, and together these generate learning situations and educational modalities which must be utilised to their fullest potentials, avoiding waste and confusion. *Education is a comprehensive national task involving all peoples and all society* in the service of human resources, national integrity and abiding culture.
4. We should devise and attain as soon as possible an integrated system and content of education, comprehending the arts, the sciences and the technologies within the overall scope of Culture in its universality and diversities. The integrated education of the emerging future should serve the needs and potentials of body, mind and spirit of the human person, chasten Power and project Love in the ordering of society and human relationships, and promote creativity both in the individual and in the functioning of society. *Integrated education should serve man and social development.*
5. Integrated education and life-long learning should aim at the pursuit of excellence and the attainment of life's best quality through the range and depth of awareness, the grace and beauty of expression and the ceaseless striving toward transcendence to ever-ascending planes of consciousness. With the ruling star of moral and cultural values, integrated education should aim at the right balance and blend of the sciences and the technologies with the arts and the humanities in the overall sphere of culture and the human spirit. *Value-oriented education is essential for balanced personality and harmonious society.*
6. While Indian education should respect and serve the national ethos primarily, it must not close any doors to influence from other countries and cultures. India must contribute to the sum total of international education and draw upon its elements and innovations for the global society of the future in which our children of today will live and participate. *Indian education should draw upon the growing corpus of international education and enrich it by its own contributions.*
7. Drawing upon both tradition and modernity, science and spirituality, Indian education should aim at a great cultural resurgence of new beliefs, values and manifestations to enrich thought, adorn the arts, and promote

life's quality among all sections of our continental society. *Education should support and strengthen a great cultural renaissance.*

8. Receiving gratefully from others, Indian education should offer its own experience and insights to developing countries and thus enrich international cooperation for development. *Education should help development by cooperative enterprises.*
9. Education should sustain and promote democracy, defend human rights and contribute to peace and freedom. *The defences of peace are best built in the minds of men.*
10. Education should generate and nurture knowledge and wisdom for the culture-oriented societies of the post-industrial civilisation. In particular, it should guide decision-making for choice of new technologies by a wise up-grading of traditional technologies, adapting alien models to appropriate and specific use, and transferring sophisticated technology, when necessary. Technology should contribute to the welfare of the many and avoid concentration of power in the few. It should be used for altruism and sharing instead of mere acquisition of wealth and profit. *The use of new technology calls for great care and discrimination to absorb it into the national ethos and safeguard moral and cultural values.*

I have outlined the ten principles of educational reconstruction which could now be launched with determination, dedication and wisdom by our new government of massive mandate and youthful spirit and its larger society of hope and harmony through all the modalities of thought and action that undoubtedly exist and can also be easily devised. All that is needed is a firm and enlightened political will to renew and transform education for the service of man and his development. I believe it has now arrived. The making of a new man through education and the success of meaningful and relevant development call for wise deployment of appropriate technologies for the moral and material advance of our nation and its rich and abiding culture manifested in the reality and practice of moral and cultural values. All the abundant and increasing fruits of science and technology are open to us and we can choose and deploy the best for our national development, avoiding the risks and pitfalls which have troubled more developed and affluent nations.

To sum up, the road to the 21st century leads through uncertain territory and bristles with problems and difficulties; it also projects fascinating possibilities and brilliant horizons of marvellous luminosity. Will the human spirit rise to the challenge and build a new world of peace, plenty, fraternity and creativity? Whatever happens, the role of education may well be decisive—if society and its centres of power recognise this and act wisely and resolutely.

MALCOLM S. ADISESHIAH

Educational Perspectives

Malcolm S. Adiseshiah

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Educational Perspectives

ALL EDUCATION IS LONG-TERM AND TIME CONSUMING. IN FARMING, ONE can sow today and reap the harvest within three to six months. In horticulture there is an annual, sometimes biannual crop. In fishing there is a daily catch that is available. In most manufactures, product returns can be had within a year for small-scale units and two years for medium and some large-scale units. In education, however, except in the case of adult literacy where literacy learning can occur within a year, and adult education which is a form of formal education of three months or a year's duration, in all other forms of further education the time span involved is eight years for elementary education, 10 years for high schooling, 15 years for the first university degree and 17 to 20 years for post-graduate and research degrees. This time element is straightforward enough.

But this time element in education involves an inbuilt element of obsolesence in the system. The teachers who are responsible for the entire teaching and learning system have been educated themselves in a society and education system which is anything from two to five decades older than the system in which the teacher is functioning as a teacher. This means that teachers have to make a special, arduous and continuing effort to combat personal obsolescence and keep themselves, their information, their knowledge and techniques up to date. But this is not all.

The education system also calls for an element of prescience, a kind of technological forecasting. For the teacher, who was trained in a society and a learning system half a century ago, has to overcome its inertia and educate his students to live in society some three to five decades from the present, a society whose contours he can foresee but dimly. Hence, when judging past achievements or non-achievements and assessing the present somewhat chaotic situation of the Indian education system, the distortions caused by this time-span need to be taken into account.

Achievements

The major achievement of our educational system since Independence is its incredible quantitative expansion.

From 20 million students enrolled in the system in 1945/46, before Independence, we had in 1983/84 110 million students reported as enrolled. From 5,10,000 teachers in 1945/46, the number of teachers has increased to 2.5

million in 1983/84. From 1,80,000 primary and 10,000 secondary schools, and 20 universities and 1171 colleges in 1945/46, in 1983/84 the number of primary schools was 7,75,000, secondary schools 50,000, universities 120 and colleges 5000. Educational expenditures increased from Rs. 120 crores in 1945/46 to Rs. 5000 crores in 1983/84 at current prices. This is a truly remarkable achievement as the rate of growth recorded in every facet of education over these 40 years averaged 500 per cent, while the rate of population growth was 110 per cent, of employment growth 90 per cent, of agricultural growth 100 per cent, of industrial growth 200 per cent, and the rate of growth of the country's national income 140 per cent. This raises a rather important question.

Even allowing for the generally accepted proposition, that education must always be one step ahead of other social and economic indicators, so that it can act as a lead agent, there is the residual issue, whether the rates of growth of education, at its various levels and overall, should not bear some relation to other growth rates, such as those of employment or the national income. Has this lack of relationship set up a series of inconsistencies and disequilibria between the demand-supply forces in education?

Set-backs

The major set-back that the education system has suffered is that, in its content and processes, it is felt "to be dysfunctional to the requirements of the country", to use the phrase used by the Approach Papers to the Seventh Plan. This dysfunctionality of our education system finds expression in its inability to meet the requirements either of the individual or of the country. Thus education and the education system stand opposed to each other in our country. Education is learning: our education system is memorising. Education is learning how to learn: our education system is learning how to conform. Education is the right of every Indian: our educational system is a denial of education to the majority of Indians. Education is lifelong: our educational system is age-specific at 11 (elementary), or 14 (middle-school), or 18 (secondary), or 21 (college) years of age. Education is democratic, calling for equalising educational attainments: our educational system is elitist, dividing the educated few into intellectual (first class, second class, third class and failed) and social (forward, backward and most backward communities) hierarchies. Education is humanistic, standing for work, truth, understanding, cooperation, through its one to one relationship: our educational system is ahuman, if not anti-human, promoting intellectual laziness, dishonesty, corruption and egoism based on the principle of each man for himself, with the devil taking the hindmost.

In this situation, it is important that we realise and bear in mind the encouraging truth that, while the education system is failing and falling, education as the learning process is autonomous, and can give rise to new and innovative models, on the one hand, and can become an agent of individual fulfilment and social change, meeting freely and squarely the revolution of rising expectation of our people, the demands of national unity and integration and what Gandhiji called the character-building end-purpose of all education, on the other.

The immediate quantitative priority

There are two quantitative priorities facing the education system of our country: (1) One is primary education, which by 1990 has to be expanded to fulfil the constitutional obligation set forth in article 45 (on which we are two and half decades behind) to provide education to all up to the age of 14. This will involve an additional enrolment of 60 million children during the Seventh Plan. (2) The second expansion area is with regard to providing adult education to all adult illiterates in the age group 15-35 years by 1990. At the start of the Sixth Plan, there were 100 million adult illiterates in that age-group. Their number is expected to increase to 110 million in 1990, and if we assume, on the basis of Ministry of Education statistics, that 22.3 million of them have been made literate during the Sixth Plan, there are left 87.77 million illiterates to be made literate, plus the 22.3 million neo-literates from the Sixth Plan, who will have to be provided post-literacy continuing education. This priority has been set forth, as far as primary education is concerned, from the Fourth Plan and, as far as adult literacy is concerned, from the Fifth Plan, and yet their targets are far from being attained.

It should be understood quite clearly that, to so universalise primary education and adult literacy by the end of the Seventh Plan (1990), there must be no expansion of secondary education and higher education—arts and sciences universities and colleges, as well as technical, medical and agricultural post-secondary education. This is a decision of self-denial, of self abnegation which we the educators—coming mostly from the group which has had higher education and which has always made pronouncements in favour of primary and adult education, but has acted on the contrary to expand secondary and higher education—have to make, if the 'overriding priority' of primary and adult education is seriously accepted and is to be honestly and at last realistically acted on. Table I shows vividly that we do not practice what we preach, that we do not put our money where our mouth is, to use an Americanism.

Even for the Fifth and Sixth Plans, when the percentage was raised, the actuals are lower than the outlays, which shows the low priority given in execution, with the declining trend coming into action again. What is therefore involved is a complete turn around in the financial and substantive priority accorded to primary and adult education.

Retention

Giving the necessary priority to primary and adult education involves shifting the emphasis "from more enrolment to retention of children after enrolment and to ensuring that children attain the basic learning objectives". In my state, Tamil Nadu, an official survey established the primary school drop-out rate at 51.1 per cent. For the country, the Ministry of Education computes the drop-

TABLE 1

Expenditure on Primary and Adult Education

Plan	*Total education (Rs crores)*	*Primary education (Rs crores)*	*% on primary education*	*Adult education (Rs crore)*	*% on adult education*
First Plan	153	85	55.6	5	3.2
Second Plan	273	95	34.8	4	1.5
Third Plan	589	178	30.2	2	0.3
Annual Plan	322	65	20.2	0.2	0.06
Fourth Plan	823	235	18.2	6	0.7
Fifth Plan outlay	1726	743	43.6	40	2.3
actuals	1286	410	31.9	32	2.4
Sixth Plan outlay	2524	905	35.8	120	4.7
actuals	2900	900	31.0	110	3.5

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Source: *Annual Reports* of Planning Commission and Ministry of Education.

out rate at around 67 per cent as Table 2 shows[1].

This retention problem applies also to the adult literacy programme where there is a similar gap between enrolment and completion of course. A quick appraisal of the 2,573 adult education centres run by the voluntary agencies in Tamil Nadu showed that 50 per cent of the 30 initially enrolled in each centre "dropped out" [2], and that only 4 adults per centre become learners.[3] Tables 3-6 set forth the problem of retention and learning attainment in the adult education programme.

The first-level educational profile that emerges is thus awesome. If actual attendance is compared to the dropouts, the push-outs (emerging from stagnation) and the left-outs, the sad conclusion that emerges is that there are more children in our country outside the primary schools than in them.[4] And parallely the number annually joining the illiteracy cohort is larger than the number becoming literate.

The basic reason for the non-retention of a pupil in a school is the poverty of the parents. It is no accident that the national drop-out rate is above 60 per cent and the national poverty level is also about that. A son in a poor family has to work alongside his parents in the farm, or grazing cattle, or at a cottage

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[1] *Towards a Learning Society: A Plan for Education, Science and Technology, 1976-86*, State Planning Commission, Madras, 1975, para 1.15 p.12,.

Education in India 1965-66, Ministry of Education and Youth Welfare, New Delhi, 1967, p. 102.

A. Bordia: *Return to the Riots*, Annex I (Roneoed) Indian Institute of Education, Pune, 1985.

[2] *National Adult Education Programme: An Appraisal of the Role of Voluntary Agencies*, Table 5.20, Madras Institute of Development Studies, Madras, 1980, p. 80.

[3] Ibid, Tables 5.16, 5.17, 5.18 (a), pp. 74-9, para (iii) p. 10.

[4] Malcolm S. Adiseshiah: *Backdrop to Learning Society*, Madras Institute of Development Studies, 1978, p. 4.

TABLE 2

School Drop-out Rates, 1975-83

(Figures in 000)

Year	*Gross enrolment in Class V*	*Number of children who successfully complete Class V*	*Rate of children who successfully complete Class V with reference to enrolment in Class I in the corresponding cohort*
1975	7849	6609	31.29
1976	8188	6894	31.08
1977	8375	7502	—
1978	8476	7137	32.48
1979	NA	8588	32.89
1980	NA	8253	32.89
1981	NA	8252	32.89
1982-83	NA	8369	32.89

Sources: (a) *Handbook of Educational and Allied Statistics*, Ministry of Education, New Delhi, 1983.

(b) *Demographic and Allied Statistics in India*, National Institute of Educational Planning and Administration, (NIEPA), New Delhi, 1980.

TABLE 3

Distribution of Dropouts and Marital Status

Age-group in years	*Total (N=85)*	*Males (N=36)*	*Females (N=49)*
15-19	28	17	39
20-24	33	47	19
25-29	16	11	20
30-35	23	25	22
Married	51	42	61
Unmarried	49	58	39

Source: Madras Insititute of Development Studies (MIDS), appraisal of voluntary agencies.

industry, or in a factory, in order to save on hiring labour or to supplement the inadequate family earnings, and the daughter has to stay home and cook for the family, and/or look after the baby so that the mother may go out and earn. This is brought out vividly by the Central Advisory Board of Education:

> . . . full time attendance in schools is possible only for children coming from well to do families who do not need their labour for balancing the family budget. Such children are in school even now (except the girls in some areas) . . . for the time span of the next ten years with which we are concerned, children of the masses will not be able to attend schools on a

TABLE 4

Learner's Ability to Read Words from a Passage

Ability to	*Percentage of respondents with such ability*			
	Completed learners			*Current learners*
	Males	*Females*	*All learners*	
Read fluently	16	11	14	8
Read with difficulty	59	29	33	29
Read words by spelling out each letter and then pronouncing the word	8	15	11	10
Identify only letters	18	45	31	53
	(N=61)	(N=55)	(N=116)	(N=78)

Source: Madras Institute of Development Studies (MIDS), appraisal of voluntary agencies.

TABLE 5

Learner's Ability to Write Dictated Words

Ability to write correctly	*Percentage of respondents with such ability*			
	Completed learners			*Current Learners*
	Males	*Females*	*All learners*	
More than 60% of words dictated	31	20	26	21
40-60% of words dictated	20	16	18	15
Less than 40% of words dictated	31	15	23	8
Only letters or nothing	18	49	33	56

Source: MIDS appraisal of voluntary agencies .

> whole time basis. If you try to bring them into schools on a full time basis before the economic conditions of the family could improve, we have to spend considerable money and energy on propaganda and 'incentives'; and in spite of all this, the effort will only result in nominal enrolment and lead to stagnation and wastage. We do feel that the over emphasis now placed on 'incentives' leads to an inordinate increase in costs and is proportionately counter-productive of results. Because what we are trying to do—full time enrolment of children who are under a compulsion to work—is economically unfeasible.[5]

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[5] *Report of the Working Group on Universal Primary Education*, Central Advisory Board of Education, New Delhi, 1974, p.28.

TABLE 6

Completed Learner's Ability to Do Arithmetic

Arithmetic operation	*Per cent respondents who could do the operation in*		
	1,2 or 3 digits	*1 or 2 digits*	*At least 1 digit*
Division	4	21	36
Multiplication	9	21	56
Subtraction	41	67	93
Addition	50	70	98

Source: MIDS appraisal of voluntary agencies.

Does this mean that 100 per cent universalisation of primary education cannot be attained until poverty is eradicated in the country? This, unfortunately, is not recognised in the Plan documents, and therefore it is important that this simple but brutal socio-economic fact be faced and the necessary social and economic action be strengthened to eradicate poverty as rapidly as possible. This also means that the adult education programme need not suffer from the same disability, if it is made part of the ongoing struggle against poverty, which the three-fold strategy of the programme as formulated in 1978 aims at. In the meanwhile, for improving the holding power of the school, there are certain palliatives that can be undertaken. One is to provide all children up to the age of 15 one solid nutritious noonday meal. The experience of the state where this is being done since June 1982 is that (1) it provides a relief to poverty, as children from families living below the poverty line are assured of at least one meal a day, is manageable because it costs that state only Rs. 150 crores a year, which is 5 per cent of the annual budget, and is an investment in the future of the coming generation of the state and the country, (2) it increases school attendance, the annual enrolment which was 1.75 lakhs is reported to have jumped to 2.63 lakhs in 1982/83 and 3.82 lakhs in 1983/84, and (3) it improved the health status of pre-school children in respect of their weight and arm circumference, and for others reduced night blindness.

On the basis of this experience, I draw one important conclusion. As the eradication of poverty is likely to take a long time, this programme of feeding children up to 15 years of age should become one of the points in the twenty-point national programme. I am glad to see that it is being so seriously considered and an inter-secretarial committee is drafting a detailed proposal and examining its implications.

There are other factors operating against the holding power of the school. The existing infrastructure of the primary school also induces dropouts and promotes push-outs. An official survey[6] reports that out of 7.75 lakh primary schools in the country, 53 per cent, i.e. 4,10,750 schools, have no buildings; 59 per cent, 4,52,250 schools, have no drinking water supply; 40 per cent, 3,10,000, have no black boards; 1,62,000 have no mats for children to sit on; 11 per cent, 5,50,250 schools, have no libraries; 34.7 per cent, 2,68,925 schools, have only one teacher (with J&K recording 78 per cent such schools, Karnataka 72.5 per cent, Rajasthan 52 per cent); and 3000 schools have no teacher at all. At a time when we are planning to introduce computer-aided instruction, which is needed for us to enter the twenty-first century and which will be introduced in our elite urban schools to start with, these basic lacks of our rural schools must and can be met. This is well within our means; what we lack as teachers, educators and the community is the will to remedy these basic infrastructural lacks. This also calls for some change in the balance of expenditure on primary education, which on an all-India basis is constituted as follows: 95.3 per cent of the annual budget is spent on teachers' salaries, 1.1 per cent on teaching aids, 1.7 per cent on infrastructure, and 1.9 per cent on administration. In my state, Tamil Nadu, the Education Finance Commission reports[7] that 99.2 per cent of the budget estimate of the primary school is spent on teachers' salaries.

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[6] NCERT: *The Fourth All India Educational Survey*, New Delhi, 1982.

Thus improving the school infrastructure would be another palliative which would weaken the factors in the school environment that tend to drive children out of our schools as they do today.

Other possible alleviative measures include part-time learning systems, non-formal methods, and relating the content, method and timing of education to local needs, for which detailed block- and school-level planning should be introduced. The use of non-formal education for dropouts and left-outs is to give them learning opportunities in accordance with their preferences and needs, and at times suitable to them (when they are not at work), as is being done in the case of adult literacy programmes in the evening hours, and including learning of some income-generating skills. The key here is to replace the present fixed school hours by hours related to the rhythm of life and work of the local community. An equally important element is replacement of single point school entry by a multi point system of exits and entries. Here I would like to sound a note of warning: formal education and non-formal education should not be kept in two water-tight compartments. This is to obviate the danger of formal education becoming first-class education for the first-class (elite) children and citizens, and non-formal education becoming second-class education for second-class (poor) children and adults. Also, under such compartmentalisation, the riches of non-formal education will not become available to formal education. (China has solved this problem by terming and organising both school education, education for leftouts, and adult education as formal education, avoiding completely the use of the term and connotation of non-formal education.)

This use of both full-time and part-time systems and formal and non-formal methods would ensure that: (1) every child is educated, has both formal and non-formal education in forms, methods and processes, and (2) the two being meshed together, feed in and feed out of one another, so that reform of curriculum, learning methodology and evaluation systems developed by non-formal education flow into formal systems, providing the firm and empirical basis for the latter's reorientation and restructuring. This also involves multi-point entry and exit in the school system as noted earlier which is one way of ensuring a merging formal and non-formal education.

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[7] *Report of the Tamil Nadu Education Finance Review Committee 1975*, p.26, Government of Tamil Nadu, Madras, 1976, p.26.

Decentralised planning

It has been proposed that, to ensure the holding power of the school, increase its rate of retention, and relate the content, method and timing of education to local needs, educational planning should not be concentrated, as it is at present at the national capital, New Delhi, or the state capital, like Madras or Lucknow, but that it be decentralised to the block level and school level. This is a sound principle because all education is in the end a 1:1 relationship, and the more disaggregation there is in planning and executing education, the more nearly the learning objectives can be attained.

First we need to commit ourselves whole-heartedly to the principle of decentralised planning as against the tradition of centralisation that we have built up, and then face its implications which, inter alia, include questions of: (1) whether block-level educational planning can be developed without all planning—agricultural, rural development, health, housing, etc. being planned at the block level. (Can there be an island of purity in an ocean of impurity?), and (2) whether the poorly equipped rural school referred to earlier, with the various rural power networks that control even this low-level educational unit, is capable of planning its 'content, learning methods and timing'. How can we avoid local control of education becoming another bonanza for the elite urban schools? What does this involve in the way of strengthening the rural school infrastructure? These questions need reflection and answers.

Secondary education

Under secondary education, I address myself to two questions, namely, the nature of the reform of the secondary school curricula and the chaos in the higher secondary system.

Full-time secondary school courses need to be restructured to lay the basis for learning, continuous learning, in the languages, and in the natural and social sciences, art and physical education—all within the context of work experience.

Education will then be an expression of the exploding forces of science and technology which will be operating in our agriculture, animal husbandry, forestry, fishery, mining and manufacturing industries. (I am using 'science' and 'technology' comprehensively to include physical, natural, human and social sciences and their technologies.) The science and technology developed in schools and colleges will have two primary functions. First, they will be the bridge between the world of study and the world of work, between reflection and action, between theory and practice. At every stage of learning in school and out of school, there will be a work-experience component along side of a theoretical component; both will be science-based learning experiences in themselves and for themselves—not simply for what they will lead to. This science based learning, at the early stages, will centre on gardening, fertilisers mix, pesticide use, land and water management, biology of the birds, insects and animals, physics of heat and concrete, chemistry of the soil, electric circuits, weaving, cooking, etc., and at higher learning levels around agricultural, animal husbandry and fishery sciences, agro-based industrial sciences, and various other technologies. The second function will be for science and technology and its research findings in our learning institutions to be central to agricultural and industrial development, and not, as they are today, linked to the non essential goods where they are marginalised to the science and research of the industrialised countries and are a pale and ineffective imitation of the research going on there. Our science and technology systems function is to be the infrastructure for the full and improved production of goods and services needed by our poverty sector. Then our education system will not be the gateway to society: it will be the centre of society. It will not be shut off from the farm and market place. It will include the farm and the marketplace.

It is not realised that the secondary school is the terminal point of formal education (not of learning but of formal schooling) for a large number (perhaps a majority) of students. The normal reported failures of those taking the SSLC and BA, B Sc and B Com examinations is 60 per cent. I said reported failure, because the real failure is much higher. A state commission enquiring into examinations, reports:

> At the SSLC examination held in 1982 only 20.19 per cent of the candidates came out successful without moderation. The percentage of successful private candidates was 12.56 per cent. Moderation raised the general level of pass to 34.55 per cent, but for private candidates the jump in percentage was from 12.56 to 47.9 per cent.

It also reports that the real percentage of passes in the 12th year, without moderation, was 8 per cent in one university area and 12 per cent in another in 1982. The percentage of passes for the degree courses was, it reports, about 30 to 35.[8] What is not realised is that several studies have shown that, of the 60 to 80 per cent of those who fail at each stage of education, starting at the secondary school stage, not more than 10 per cent of that 60 to 80 per cent obtained a pass through one or more subsequent reappearances.

This fact, that the majority of secondary school completers in effect terminate their schooling at that point raises several issues. First, it has certain curricular implications. The secondary school curriculum should ensure that each student at the tenth standard is equipped with some competence for life and work, and is in command of an intellectual base adequate for those who have an aptitude for higher education.

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[8] *Report:* Justice M.P. Menon Commission of Inquiry, paras 3.5 and 3.6, Government of Kerala, 1984.

A second issue relates to the validity of the examination system, to which attention will be paid later. At present, as long as the present examination system exists, a working assumption is that the majority of those who fail in the SSLC examination do not have an aptitude for secondary education.

This assumption could be questioned. But what cannot be questioned is that secondary education (and all further education) is a highly (state) subsidised system of education. In a country where resources are scarce, this wastage of resources needs to be taken seriously. For the next 10 years, the question needs to be faced whether there should not be some selective admission to the secondary school. This will not affect students from Scheduled Castes and Scheduled Tribes and backward classes, as the reservation system will take care of the first generation learners.

And this is where an open school system should be developed and be available to those who do not find a place in the subsidised school system but who wish to continue secondary studies on a part-time/own-time basis. Such an open learning system can be even more innovative, flexible and tailored to individual needs and aptitudes than the formal system, and should be able to take full advantage of the modern communication and electronic facilities.

Higher secondary education

Chaos in+2

At the higher secondary stage, there are several problems. First, as a recent study shows, there is utter chaos in this area at the+2 stage. Five states—Punjab, Haryana, MP, Rajasthan and UP—have not yet adopted the 10+2+3 system; vocationalisation of the+2 stage has not been adopted by most states: in one state, which has a student enrolment of 1,80,000 at this stage, only 1080 students, less than one per cent entered the vocational stream in 1984/85, and that is the general position in most states; the location of the +2 stages varies widely, in a few states it is part of the school system and is called higher secondary, in others it is called junior college, either attached to degree colleges or established independently; in one state the 11th year was attached to schools and the 12th year to colleges, and in still others it is called pre-degree and is attached to colleges affiliated to universities.[9] This wide-ranging variation is one of the reasons why the double purpose of this 2-year stage of education has not been understood or accepted by students, parents, teachers, state governments and society generally, and this is also the reason for the confusion in the curricular offerings at this stage of education.

In this situation, what is urgently needed is for all states, to start with, to make the +2 stage a part of the school system.

The academic stream

Second, such organisation will make it possible to organise the higher secondary schools with two streams—*academic,* leading to under-graduate

[9] *Higher Secondary Education,* Indian Institute of Education, Pune, 1984.

and post-graduate courses in arts, sciences, agriculture, medicine and engineering, and *vocational* for the vast majority, leading to employment or self-employment. For those who wish to enter the academic stream, a test should be devised, with due allowance for students from the Scheduled Castes and Scheduled Tribes, which the reservation system ensures. We have in all states accepted this selection principle for admission to professional colleges. The same principle needs to be extended to admissions to the higher secondary as well as the arts and science undergraduate courses. In one state, every SSLC certificate has stamped on it, the statement, "Eligible for Higher Education". This automaticity needs to be eliminated.

The vocational stream

Third, as the main purpose of the vocational stream is to prepare its members for employment, preferably self-employment, the course should concentrate on the theory and practice learning of various skills.

There are several issues which the vocational stream raises. One is that, given the labour-market situation and the continuing growth in the number of educated unemployed, including the technically and vocationally trained unemployed, the increasingly real 'choice' for the vocational stream students is employment, and not a theoretical non-employment involving a higher technical degree. The possibility of vertical mobility for the vocational stream student may however be provided, so that a few who are really qualified and desire it can go on to higher technical or scientific education. For me, this is a theoretical issue.

Another issue is that the vocational curricula should be based on the employment opportunities in the locality, as determined by both a local survey and the cooperation of the governmental and non-governmental employing agencies. Thus the employing agencies such as the Department of Veterinary Medicine, Dental Department, Department of Tourism and Hotels, etc., and private sector employers should ensure paid employment for about 15 to 20 per cent of the vocational stream completers, while the nationalised banks must make loans available to the other 80 to 85 per cent for self employment activities.

A further issue is the vocational teacher. In some areas, where the equipment needed is not overly costly, the teacher can be recruited by the school, along with the purchase and installation of equipment; when the equipment needed is costly, as for dentistry, dairy management, auxiliary nurse midwives (ANM) and community health workers, tourism and hotel work, the teachers could well be those teaching and working in these fields, some of whom could be paid from the+2 school budget. Finally, in order to avoid diversion from the task of acquiring a precise employment skill, for the self employed, to start with, the examination for the vocational stream students can be replaced by a cumulative record of skills learnt by the student during the two years. Even for salaried employment, this record could be the basis for the employer or the further education institution administering his/its own selection test, which is increasingly being done.

Teachers and administration

Teachers have to be adequately trained, fully motivated and feel accountable for the results of their work. The motivation part should cover the need for the teacher to be a learner, to be continuously learning, and in that sense sharing a common status with the students—both are learners and both are life-long learners.

Education of the future will be life-long. We should be entering the 21st century with the scandal of mass adult illiteracy wiped out. But from the massive effort to be made during the remaining 15 years of this century to educate our illiterate fathers and mothers, or elder brothers and sisters, a glimpse of a great and revolutionary truth will emerge—that education is not the spatial monopoly of something called the school and college; that it is not a time-bound learning experience; that there is no such thing as childhood education, adolescent education, youth education, or adult education; that 'pedagogy' and 'androgogy' are just misleading time-distorting educational bureaucratese. There is just education which is a way of life, a lifelong way of life. Every year, every month, every day, from the cradle to the grave, a person will be learning, open to learning and given the opportunity to learn in the home, school, university, factory, farm, hospital, office, cooperative, temple, trade union; political party, cinema and club. Education will be open. Schools without walls, polyvalent classes, integrated schools, universities of the air, will be juxtaposed with firms, farms, factories, and business houses as education extension agents with their survey, documentation and research facilities. The whole wide-open area of self-instruction, similar to what is taking place in our rural areas, will be operative. Let us not forget that for the farmer and his wife the farm is the school, what they do in their daily life is their curriculum of learning. Their experience in dealing with their daily survival problem is the substance of their evaluation. Lifelong education will be a fact of life.

Lifelong learning also means that the artificial barrier separating the teacher from his students will be broken. As we move into the 21st century, the last thing that will be seen as we enter a classroom will be a teacher standing on a platform pouring forth words of wisdom (or unwisdom) into the passive and receptive ears of his students. This is one anti-education relationship that will cease as we move forward in the next decade and a half. Instead, both the teacher and students will be engaged in a common search of learning, of learning every day and in every way, of learning how to learn.

There is then left the question of administration. There is the wider question of administrative reform which is not dealt with here. More immediately there is need for renovation of training methods and processes as well as improved supervisory structures. In this necessary part, the kind of structures recommended by the two commissions of teachers need careful scrutiny, as some of them seem to respond to the trade union character of teachers associations, which has become the dominant trend today, rather than updating his knowledge and raising his efficiency. (Out of 8 selected recommendations of Commission I, 5 have to do with teachers remuneration, out of 5 of the Commission II, 4 are on teachers' salaries, housing, medical leave; etc.) In fact there is so little attention given by the teachers associations and by the Commissions to the teacher's vocation, to his substantive responsibilities and academic burdens, that the means by which the teacher can develop the qualities listed above are not clear. In this area of teacher education and motivation, universities carry an important responsibility which they have not discharged. One of my suggestions is that the UGC should review the existing programmes of faculty improvement and reformulate them in the form of pre-service and in-service enrichment and professional improvement programmes. I go further and ask, should teachers, like priests, be chosen on the basis of a tested vocation, and should teachers stop forming trade unions like associations, so that their vocation as teachers is fully expressed and discharged? The teachers' problems and grievances should be taken care of by the normal grievance machinery in each school and this should be specifically provided for.

Finance

The educational system costs the State—the union and states—Rs. 5,250 crores per annum; and various private sources—families and parents, religious, educational and cultural foundations and missions—an additional Rs. 3,000 crores per annum. With the payment of teachers' salaries by government in all states, at all levels from primary to college and (through the block grant system) university, education has become free for all students, the majority of whom are from the well-to-do classes. (The last statement on the social composition of our school and university system was made in the 1978 policy paper of the UGC which found that 70 per cent of those who complete school and college courses are from the top 30 per cent of society.[10]) This means the State is providing free education to students from well-off families. If to this is added the fact that educational expenditure, like the major part (90 per cent) of all governmental expenditure, is financed from indirect taxation (which includes the state taxes which are all indirect taxes) and paid mainly by the poor majority, education, at all stages, has become an instrument for transferring resources from the poor to the rich in our country. This fact is usually not faced but swept under the carpet. The union government and the UGC, on the other hand, state as their policy that they are against the levying of capitation fees by colleges, and that a law is to be passed derecognising colleges which collect capitation fees.

On this count, I raise a basic issue. To me, the major financial issue is why students from well-to-do families, who form, as noted earlier, the vast majority (70 per cent) of those who gain from school and college education, should not pay fees to cover the cost of their education—whether general or professional. Students from Scheduled Castes and Tribes and other poor families should continue to get freeships, fellowships and loan scholarships to cover costs of books, hostels, etc. The others must pay fees, including contributions towards buildings and their maintenance. This introduces a different approach to the question of capitation fees (which are paid by those who can afford them) and which should be officially received, receipted and audited in order to ensure that they are used for the purpose of institutions' development. It this were done, along with the economy measures suggested and community participation, the Seventh Plan educational allocation would be adequate to finance (1) rural schools, (2) adult literacy centres, and (3) the education of students from SC, ST and other poor families—and meet our continuing commitments in secondary and further education.

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[10] *Policy on Higher Education*, University Grants Commission, New Delhi, 1978.

The emerging educational model

I now sum up the above analysis.

The present model with its structured hierarchy of time-dependent learning levels, single-point entry, isolation from society and the marketplace, outdated learning content, irrelevant evaluation techniques and class-biased survival must be replaced by a systems model. The action steps for this purpose would be:

1. Launching the non-formal education sub-system for the two priority groups—school dropouts in the age group 6-14, and working adult illiterates in the age-group 15-40, involving devising functional curricula, producing learning materials, mobilising teaching resources from trained teachers as well as progressive farmers, engineers, musicians, dramatists and sportsmen, and using existing buildings, labs and workshops for running the concentrated courses. This has become official policy and we have made a start on this in some states; it needs to be accelerated in all of them.
2. Reorganising the existing formal education sub-system into multiple entry and exit points at its different levels, so that students could enter, leave and re-enter the school and university system at any one of several points to answer the call of work in the home, farm, factory or office; continue their education through organised non-formal programmes and re-enter the school and university at the appropriate points when they so desire in order to acquire further learning skills. The launching of the non-formal education system and this reorganisation of the formal system will help the system serve the majority now excluded. This reorganisation of the formal system has now been talked about for years, going back to 1910, since the time of Gokhale. It is now for us educationists to translate this proposal into a practical and working plan in each state, identifying the exit points and the certification of existing students, defining the re-admission requirements and procedures, together with means of evaluating the students' non-formal education experience, etc., and put the system into operation.
3. Establishing the relationship between the two sub-systems, involving the cross-over points and the feed-in and feed-out provisions referred to earlier, and the nexus between their educational content, methods and technologies of teaching and learning.

4. Vocationalising the second level through a system of diversified learning experiences in higher secondary schools and technical schools, so that such work-based education is freely available to all up to the age of 15 or 16 in school and out of school and becomes the constructive skill forming a terminal point for 80 per cent of the full-time students entering the school stream.

P.N. DAVE

An Approach to Comprehensive Access to Primary Education

P.N. Dave

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An Approach to Comprehensive Access to Primary Education

LONG BEFORE THE PUBLICATION OF 'LEARNING TO BE', THE MOST revered and talked about document, a frail, simple man in a loin cloth wrote the following memorable lines which are applicable to any developing country:

> Education should be so revolutionised as to answer to the wants of the poorest villager.

Earlier, a similar concern regarding the malady of Indian national life was expressed by the great sage, Vivekananda:

> Education, education, education alone. Travelling through many cities of Europe and observing in them the comforts and education of even the poor people there brought to my mind the state of our people and I used to shed tears. What made the difference? Education was the answer I got.

Few Indians have been able to comprehend the problems of education in this country as these two illustrious sons of the soil did. Although Gandhiji had first-hand experience of the British system of education, he was not enamoured by it, like so many pseudo-westernised intellectuals. The fact of the matter was that many stalwarts, the Nehrus, the Patels, Azad, and others, accepted his principles and followed his advice. Unlike Swamiji he turned out to be a commendable socio-political agent for the cultural transformation of this country.

The legacy of education being the sole, exclusive right of a few—the obvious elitist bias cultivated through centuries in this country—was at once sensed by them and consequently they independently formulated indigenous, versatile education systems that could meet the needs of the masses and benefit them. Especially Gandhiji, like Buddha, heralded a movement of mass education in the form of Basic Education.

The problem in retrospect

Apart from intuitive recognition of the elitist bias in education, there exists enough evidence, direct and indirect, to assert that, not only has the great divide between the haves and the have-notes existed from ancient times, but was perhaps deliberately created by those who acquired knowledge. Our hierarchical caste system, comprising Brahmins, Kshatriyas, Vaishyas and Shudras, is concrete evidence of the existence of a discriminatory social system cleverly designed to deprive a section of one's own people from having access to knowledge. It was so ingeniously devised that this section remained at a disadvantage not just for their life span but for generation after generation, developing an inferiority syndrome which has yet to be removed, despite such an intention being inscribed in the Constitution of the republic itself. It is hard to find any other example in the history of the human race of a section of people within a society being deliberately denied access to knowledge. One finds it difficult to believe that enlightened people, as they were by any count, could originate and perpetuate a system like this, whatever might have been the compulsions and exigencies of the circumstances.

Conceding that mythological fables are not historical evidence, the poignant tales of Satyakam Jabala, Karna (the son of Kunti and yet not a Pandava!), Ekalavya and many others, until the period of Buddha, are very difficult to wish away. One might assert that, perhaps, these tales of woe are more entrenched in the psyche of a Hindu than the glorious facts of the golden period of Indian history.

The Buddha was the first visionary and master reformer who very successfully used education as an instrument to fight the domination of the exploiting class. His was the revolutionary age of a movement of mass education. Being a great teacher, he chose the people's language—Prakrit instead of Sanskrit—as a medium of communication (or instruction) to educate the masses. In him, to use the modern jargon, one sees an insightful manager, who meticulously built up an infrastructure for a formidable socially relevant education system, covering primary to university levels. Rare it is to find equity and excellence, mass education and higher education, flourishing together, irrespective of not only caste, creed, religion and sex, but also race, country etc. Nalanda and Taxashila are rockstrong examples of excellence on the one hand, while the large number of *bhikhus* (around 20 in each town) doing nothing but teaching, is a shining example of equity, i.e., delivering education to one and all at the doorstep. A contemporary of the Buddha, Mahavir, also challenged the Brahminic monopoly on knowledge and tried to remove the blocks against access to it for the common man. But for this short period, the gulf remained as abysmal as it had ever been.

In fact, the medieval period, particularly the 16th, 17th and 18th centuries, was one of cultural stagnation, being labelled by some as the dark age. It is held that, due to political insecurity and social upheaval, women's education suffered terribly, the effect of which is still evident in the present position of women's education in the country, particularly in the northern states around the capital which witnessed and bore the brunt of the medieval turbulence.

Unfortunately, the era of British rule turned out to be one more adverse and perhaps the more decisive block to providing education for all. As is well known, in the struggle of orientalists, who were in favour of imparting indigenous education to the masses in the vernacular languages, and the Aglicists, who were in favour of spreading Western education to a few, the latter won out. The following excerpts from 'Macaulay's Minute' (1835) make very painful reading for any Indian.

> All parties seem to be agreed on one point, that the dialects commonly spoken among the natives of this part of India contain neither literary nor scientific information and are moreover so poor and rude that until they are enriched from other quarters, it will not be easy to translate any valuable work into them .... I am quite ready to take the oriental learning at the valuation of the orientalists themselves. I have never found one among them who could deny that a single shelf of a good European library was worth the whole native literature of India and Arabia. The intrinsic superiority of the Western literature is fully admitted by those members of the committee who support the oriental plan of education.

It will be an exercise in futility to waste any time on so starkly biased an assessment of a culture in general and literature in particular. However, what is more significant to note in the context of the topic under reference is that the opportunity for mass education was lost for generations. This poignant and bitter truth was percieved by Gandhiji. It is not out of place to mention here that it is generally agreed by scholars that the implementation of the indigenous scheme of Basic Education was sabotaged by the aglicised bureaucrats for no other reason than to perpetuate the elitist system of education for a few, as did our ancestors centuries ago. Macaulay's twin intentions have thus been achieved: (1) Creating an elitist educated class with a Western outlook who can help govern a vast country like India, and (2) Using such a class for preventing an indigenous system of education taking root in India so that the gap between the common people and the alienated elite would never be bridged.

The demand for Universal Primary Education (UPE) as a political platform was placed before the Indian Education Commission by Dadabhai Naoroji in 1932. Gokhale's bill (1910) seeking to permit local bodies to introduce compulsory education in selected areas was ruled out, giving the movement a temporary set-back. Notwithstanding this, as he predicted, in 1921 the Government of India declared its support for a policy of compulsory education. In 1944, the Sargent Report recommended compulsory schooling of eight years and prepared a long-term plan to achieve the goal within 40 years (1944-84). Later, the Kher Committee modified this, setting 1960 as the year for its attainment. This was reiterated in Article 45 of the Indian Constitution.

An alternative non-formal approach to primary education

Present status

This is no place to present a detailed analysis of data on enrolment, retention and level of achievement of learners. Briefly, out of 100 children who should enrol in class I, 83 per cent have been reported to actually enrol at the end of the Sixth Five Year Plan. This includes over- and under-aged children. Of this percentage, about 40 per cent reach class VI and only 22 per cent complete class VIII. Needless to mention, those who drop out, rather are pushed out, from the system belong to the disadvantaged sections of the society such as Scheduled Tribes, Scheduled Castes, other backward classes and girls, even from the advantaged groups. It has been estimated that, if the country wants to universalise elementary education by the end of 1990, the closing year of the Seventh Five Year Plan, 64 million additional children in the age-group of 6 to 14 will have to be enrolled and retained until they complete the full eight-year schooling cycle.

Irrelevance of the formal system

That the formal system of education has hardly helped in attaining universal enrolment and retention, or even in improving the quality of education, is no more a debatable question. The stark facts in respect of these three indicators are too evident to be swept under the carpet, even by most committed politicians and bureaucrats of the Establishment. One and all realise that this can be done only at our own peril. As is evident from the present debate on National Education Policy, we, as a nation, have preferred to face facts rather than attempt to evade them.

An alternative model

Before a new strategy of universalisation of primary education is discussed, it is pertinent to think about the consequences of attaining such a goal. Implicit in most of our discussions on this topic is the assumption that all the consequences of attainment of this goal would be positive. While the goal/aim in philosophical terms and sociological context implies a desirable direction, empirical results could indicate negative or undesirable consequences also. If it is not considered blasphemous, I would like to start discussing the problem from a hypothetical scenario at the end of the spectrum of UPE.

If all children complete the cycle of five years of education, what would the national scene look like. It is reasonable to expect them to demand also the upper level primary education. Assuming all are permitted to complete the cycle of eight years, for which all out efforts must be made, this being the constitutional commitment, what would children so educated aspire to? Naturally, further education. Even if admissions to further education are rigorously regulated, the pressure even at the school level would be enormous.

Let us now juxtaposition the present scene. With less than 10 per cent of students seeking admission to the higher secondary level of education, the present system has become so highly competitive that only those who are above the 90th percentile get admitted to the professional courses. For admission to science courses one has to be above the 60th percentile. One does not need any specialised knowledge to project the resultant scenario. As James Conant's simile in the American context strikingly expresses it: it will be like piling up a stack of dynamite in an abandoned building in a crowded city. It is not out of place to observe in this connection that some commentators have interpreted recent disturbances in Punjab and Orissa in a similar fashion, stating that a large number of aspiring educated unemployed youth may have resorted to or been exploited to opt for violent and destructive action. This, in essence, is the consequence of UPE that would be negative, the opposite of the desired goal of education. I for one cannot think of education or an alternative approach independent of the future socio-economic consequences.

Postulates

Before concrete suggestions for implementation are made, it is necessary to state the essential postulates which could provide the basis and frame of reference:

1. There are formidable socio-economic constraints under which the Indian system will have to operate for some time to come. Provision for mass education or equalisation of educational opportunities, which is a must, should be planned and managed taking due consideration of these.
2. Education is an important but not the sole input for human resource development. Along with child survival, nutritional and health status and some other indicators, it can act as a catalyst for national development.
3. Of necessity, compulsory and free education will have to be restricted to a specific age level.
4. All-out efforts need to be made to develop the full potential of each and every child, mobilising all available resources.
5. However, after this age, selection of able, talented and meritorious ones will have to be resorted to. As the children continue to climb the ladder of education, the criteria for selection should become increasingly stringent. Needless to mention, such a selective process should be comprehensive and therefore inclusive of the assessment of non-cognitive and cognitive characteristics of the learners, using a variety of tools and techniques of assessment.
6. For too long has the dichotomy between education and work persisted. From the initial stage, both should be so blended that the academic and work-skill distinction is not allowed to operate for or against either of them. In fact, from the very beginning, work, art and academic subjects should be integrated for developing essential learnings. As the children grow and develop, under the umbrella of a broad general course/education, varying proportions of weightage should be made available to suit their abilities and aptitudes.
7. Education should be conceived as preparation for life and therefore should be imparted in relation to real life situations. In other words, the major objective of education at any level should never be solely academic

but should be the improvement in the quality of life of the learners and their community members.

8. This necessitates the decentralisation of the decision making process in the management of schooling and the curricula to the grassroots levels.

An operational plan

The postulates stated above are comprehensive and have been evolved keeping in view the total system of education. Below is a small illustrative action plan presented with a view to achieving the objectives of increasing enrolment, arresting dropout, and improving the attainment level.

1. The goal of UPE should be restricted to the completion of class V, to be achieved as early as possible, without setting a specific target year.
2. For the duration of five years (class V), all-out efforts should be made to deliver education at the doorstep of disadvantaged children. Like food, shelter and survival, education should continue to be considered as a minimum need of all children.

[illegible]

3. The formal system, for some time to come, will not be able to accommodate more than 25 million additional children, nor will it be able to withstand the pressure of increasing demand for further and better education. This necessitates that an alternative system of non-formal education, comprising a variety of traditional, non-traditional and technological modes, be gradually built up in order to absorb the remaining 39 million children. Most important in this regard would be to intervene with flexible and relevant education packages which do not drastically change the life style of children or disturb the rhythm of their life.
4. Content and education experts from the centre (s) should interact with local teachers and the community in designing self-paced materials which are based on locally specific situations/problems.
5. Whoever would like to participate in this task of delivering education to children should be encouraged. Such a learning effort should be allowed to be organised wherever certain threshold facilities exist or are created by the facilitator. Minimum qualifications should be fixed for eligibility to function as a facilitator.
6. The facilitator should be provided with well designed, profusely illustrated, self-paced learning materials in sufficient quantity and variety.
7. The facilitator's initial and periodical training of short duration should be carefully organised. Such courses should be designed in interaction with them.
8. A district or preferably a block-level in-service and evaluation centre should be established.
9. No supervision of any kind is envisaged. The performance of the

facilitator is to be evaluated on the basis of attainment levels of children taught by him. The attainment level of the learners should be determined at the evaluation centre with the help of open question banks. These question banks would be open to one and all learners. Needless to mention, these will be meticulously designed and will consist of outcome-based items (not content-specific). Although an open system, the examination paper would be so drawn randomly from among a large number of items of varying difficulty and abilities that it would provide a reliable and valid index of achievement of the learner at a given juncture of his study.

10. Horizontal and vertical mobility should be ensured with the help of proper certification and accreditation.

R.P. SINGHAL

Secondary Education in India: a Future Perspective

R.P. Singhal

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Secondary Education in India: a Future Perspective

"ALL EDUCATION SPRINGS FROM SOME IMAGE OF THE FUTURE. IF THE image held by a society is grossly inaccurate, its education system will betray its youth", says Toffler. There is a lot of truth in this statement because, while much emphasis is always laid on past experiences, little thought is usually given to the future shape of things, in the absence of which all planning and decision making go haywire. Undoubtedly, a look into the past cannot and should not be ignored, but more important is its projection into the emerging future, This is, in fact, more true in the case of education than of any other field, as education is expected to influence and be influenced by the rapid scientific, technological and other advances which are taking place all over the world, and unless it equips itself to meet the challenges of the future, it will remain a passive instrument of the *status quo* and fail to meet the aspirations of the people.

Viewed in this context, education has to be forward-looking. All stages of education, whether primary, secondary or tertiary, have to be in a constant state of review and change, lest they are not able to keep pace with the rapid changes both within and outside the educational system. Secondary education, however, has a special place in the educational ladder as it is the terminal stage for a very large proportion of students who join the world of work as soon as they complete their schooling. Only a small proportion of school leavers pursue higher education; even for them, secondary education provides a bridge.

Secondary education, thus, on the one hand, has the responsibility of preparing students for work; on the other it has also to cater to the requirements of the higher education system, so that those who join the latter are not found wanting in terms of an adequate foundation or base to enable them to absorb and assimilate what higher education would give them.

Beyond being indigenous

While it cannot be gainsaid that each country has to formulate objectives, structures, content, curricula etc., for secondary education within the overall frame of its national objectives of development in general and education in particular, it is imperative that secondary education should cater to the emerging needs of the society and respond to the developments that take place in other parts of the world, particularly of the region in which it is located. It should, while providing for an indigenous system of education, take into account the reality that modern means of communication have made the world a global village. It would be difficult, nay inadvisable, to think of a system in isolation. Secondary education has, therefore, to cast itself in a mould which is flexible and not oblivious of what is happening elsewhere, more so in the neighbourhood.

If this premise is accepted, it becomes easier to take note of the fact that the world is moving fast towards technologisation, and things like computer-aided instruction, open learning systems, undifferentiated curricula for rural-urban and male-female populations, inter-disciplinary approaches to teaching, integration of education and work, and establishment of a value system which would promote international understanding, peace and harmony, become some of the important components of secondary education in future.

Accelerated development

It is also a fact that different countries have differing paces of development. While in Korea about 75 per cent of the appropriate age-group attend formal high schools, in India only about 25 per cent do so. In Thailand only 48 per cent of those who complete their elementary education enter secondary school. India has an almost similar situation. In Japan, as much as 94 per cent of lower secondary graduates go on to upper secondary. This indicates that the participation rate in secondary schools has to be accelerated in those countries where it is low. It also necessitates paying special attention to making secondary education relevant so that the enrolment increases and the drop-out rate decreases. The formal secondary school in India thus faces a serious challenge both from the point of view of participation rate as well as its social relevance.

Since secondary education is not yet compulsory in India, it is difficult to estimate its growth. According to an OECD Report (1979) decisions to continue post-compulsory study are known to be closely determined by the individual's performance at school, itself influenced by the pupil's socio-economic environment (parent's occupation, income and level of education) and by the chances of success which each group estimates subjectively according to its social or geographical situation. The choice of branch of study and survival rates are moreover influenced by occupational motivations and by school results which are also associated with the pupil's social background and sex. Investigations in several countries show that these different variables can be combined to provide an adequate instrument with which to forecast pupil orientation: good pupils from privileged social categories opt for studies leading to the more prestigious occupations, where the risks of academic failure and the subsequent financial returns are high; good pupils from underprivileged groups, lack of earning if they continue their studies is an important factor in their decision, and they tend to avoid the risk associated with the choice of long and general study courses.

Pressure of expansion

Notwithstanding this, expansion of secondary education in our country is bound to continue in the coming decades. Pressures on secondary education will be particularly strong due to increasing attention being paid to universalisation of elementary education and the consequent rise in the transfer rate from elementary to secondary stage. The demand for secondary education has been growing with the expansion of facilities at the lower stage, as also with the increasing awareness in the masses about the utility of education. Moreover, special attention is being paid to education of girls and children belonging to weaker sections of the community.

According to Unesco (1984), gross enrolment ratios at the secondary stage in Asia (excluding the Arab States) are presented in the table given below.

Gross Enrolment Ratios at Secondary Level
(In Asia excluding Arab States)

Year	*Male*	*Female*	*Total*
1960	26.9	13.9	20.5
1965	34.3	18.8	26.7
1970	36.3	20.3	28.5
1975	38.2	23.4	31.0
1980	41.7	27.0	34.6

Source: *Unesco's Statistical Year Book,* 1984, p.II-34 (Table 2.10)

This really means that countries of the Asian region generally have to strive hard to raise their enrolment ratios at the secondary level in the coming years as nearly two-third of their children are still out of secondary schools. In developing countries, taken as a group, the gross enrolment ratio at this level is comparatively lower (31.2 as against 34.8 for whole of Asia, in 1980) and, therefore, greater effort will be required to bring children to school in these countries. If it is compared with other regions, e.g. South America (59.1), North America (83.1), Europe including the USSR (76.4), and Oceania (70.6), the gravity of the situation becomes patent. Placed in the situation we are, one can safely assume that enrolments at the secondary stage in most countries of the Asian region, including India, will continue to rise in the eighties and nineties, specially because these countries will experience tremendous pressures from elementary education which has been expanding at a rapid rate.

Non-conventional approaches

Yet another special feature of the growth anticipated would be that non-conventional approaches will have to be adopted as the formal system for want of adequate resources, will not be able to cope with the tremendous pressures building up. Part-time and own-time education, distance education, evening schools, Sunday classes, vacation courses, open schools etc. will, thus, have to be provided on a large scale to meet the situation. A beginning has already been made in this direction. The Open School experiment in India, which was started in 1979 under the auspices of the Central Board of Secondary Education when I was Chairman of the Board, has been a success and is meeting the needs of those who were either left out or pushed out of the formal schools for socio-economic and cultural reasons. More and more learners who missed the bus are joining the Open School and other institutes of correspondence education to complete their secondary and senior secondary education. These include those who are employed or self-employed and wish to pursue further education without being required to join regular schools.

This new approach to teaching-learning would necessitate restructuring of secondary education so as to recognise and provide for non-formal and open-learning systems on a massive scale, not only as support systems but as complementary and alternate systems, with inbuilt provisions for inter-linking and bridges between the formal and non-formal, or, so to say, between the traditional and the non-traditional system of education. The non-formal system, being highly flexible and open, is more capable of accepting and adjusting to the new technology in teaching-learning such as radio, television, audio-cassettes and video.

This, however, is not to suggest that open-learning system would in any way displace the formal schools which would by all means continue to have their importance and utility. The de-schooling or the school-less society is yet a far cry and whatever some sociologists, pedagogues and futurologists may argue in support of it, both formal and non-formal systems will stay in the foreseeable future.

Relevance and productivity

An issue which is pertinent to secondary education is that of making it more relevant to the needs of the individual and of society. The population of the South-east Asian region represents the world's largest concentration of the poor. Some 500 million people live in households characterised by a per capita annual income of less than US $ 70. The great majority of these poor live in rural areas and shortage of trained manpower is a serious obstacle to the large-scale development of these areas. Experience in the region shows that general education does improve the productivity of small farmers. However, questions as to what kind of education and training is most effective and how the general and specific needs of dispersed rural populations for skills can be most economically met, remain largely unanswered (Unesco, 1980). It is neither possible nor desirable to ruralise secondary education as this may create a caste system in education. Even rural people may reject it and they have rejected it in some countries on the plea that the urban model of education would be for the elite and the rural one for the poor, so that the gulf between haves and have-nots will continue to widen. Education should not and cannot become an instrument for such a division. What is, therefore, required is to integrate education with development, including rural development.

Integrating education and work

Another issue that has remained unresolved so far is whether, at the secondary stage, the curriculum should provide for basic vocational education or specific skill training. The trend that is emerging now is to place more importance on general or basic vocational education than on specific skill training.The emphasis is on integrated high schools as in Korea, where elective vocational courses form part of general schools. Specific training for a vocation is imparted on the job as a post-secondary activity or apprenticeship training. Such a student, it is believed, has a wider choice of vocations when he enters the world of work, is better oriented towards work, has a greater adaptability and capability to adjust to the requirements of a job, and is suitably equipped to receive skill training whether in a workshop, factory, establishment, farm or other work situation as the case may be.

Linkages with industry etc.

In any case, establishing workshops for vocational courses in secondary schools and providing hardware are highly expensive; not only is the cost forbidding, it is also not possible to replace the machines at quick intervals, which may be necessary due to rapidly changing technology. Even the occupational patterns undergo quick changes due to market economy and other factors, and heavy investments in schools for vocational courses would hamper the adaptability of the schools, to change the courses and introduce new ones to suit the changing occupational demands from time to time. The practical alternative, therefore, is for the school to have linkages with industry, agriculture and other establishments for skill training. It should be obligatory for industry to provide intensive training for the vocational graduates, as it is the industry which is ultimately going to reap the benefit from such training. In fact, the industry and other employing agencies should collaborate with secondary schools even in drawing up of curricula, preparation of instructional materials, imparting curricular instruction, evaluation of students, their placements, etc. The Dual System of education in West Germany and the GDR is a case in point, where part of the training is given in the school and the rest in the factory. This, however, does not mean that polytechnics or separate vocational or technical schools in certain specialised areas have no place. They would, of course, continue to exist but the need for vocationalisation of general secondary education, without duplicating what is available in polytechnics etc., cannot be overemphasised.

Modernisation of teaching-learning

The whole concept of secondary education has, thus, to undergo a change.From traditional stereotype subjects which have no relevance to actual life situation, it has to switch over to meaningful courses which would, on the one hand, make students responsible individuals, and, on the other enhance their employability and augment their productivity, which in turn, would contribute to national development.

This would mean greater emphasis on science and mathematics, greater opportunities for project work, and an inter disciplinary approach, and more flexibility in the choice of subjects, timings, methods of teaching, instructional situations, use of modern teaching aids, computer-aided instruction and self-learning packages.

Even the teacher of a secondary school would need to change his teaching practices, and teacher training—both pre-service and in-service—would have to gear his methods to the new requirements. Unless the teaching profession keeps pace with the changing scenario, the gap between what secondary education is expected to perform and what it actually delivers will make the secondary school counterproductive. Secondary school leavers would be a frustrated lot and they would continue to enter colleges and universities aimlessly and endlessly as is the trend today in many countries, particularly the third world, where educated unemployment is soaring high.

Whereas secondary education has to be modernised and made relevant, it is also essential that it develops a complete personality for a society which is being created. This is to say that a new personality has to be developed and educated for a new society. It is evidently an exceptionally complex task and perhaps, education has never in its long history been at such cross-roads and faced so complex and major a task (IIEP, 1978).

Links with community

A continued updating of curriculum for secondary schools is, therefore, inevitable. New concepts, new theories, new experiments, discoveries and inventions, will have to be incorporated in the secondary school curriculum from time to time. But one important thing that will constantly have to be kept in mind is that a secondary school will have to establish close links with the community. Today, unfortunately, most secondary schools do not realise their social role and exist in isolation. Extension work has thus to form an integral part of a secondary school in future. The school cannot afford any longer to remain confined to its set curriculum and consequential instructional work within the four walls of the school. A close interaction of the school with the community is, thus, called for.

This would mean that a secondary school would need to out-reach and 'adopt' a nearby village, or a slum, or a hospital, or an orphanage. That would not only provide the students an opportunity to be closer to the real situation but also enable them to participate in the development of the society. It would also provide a fund of learning and help them to be useful members of the society.

Secondary school as resource centre

Similarly, the secondary school of tomorrow has to spearhead a movement in which it serves as a nodal point and a resource centre for the primary and elementary schools in the neighbourhood. The trend so far has been that these junior schools serve as feeder institutions for the senior school. There is, so to say, only one-way, upward traffic. The secondary school has now to perform the role of a 'parent' school and offer its services to the so-called feeder schools. The traditional concept and thinking has, therefore, to be modified and there has to be two-way traffic between the secondary school and the primary/elementary schools.

The secondary school has, thus, to serve as a central school of the school complex (consisting of 10 to 15 primary and upper primary schools situated in close proximity). In that capacity it has to share its resources, both physical and human, with the member-schools of the complex. It has also to share its innovations and experiments with them. In India, where a large proportion (nearly 36 per cent) of primary schools consists of single-teacher schools, the institution of a school complex may come in very handy to provide immediate substitute teachers temporarily, whenever required, and check absenteeism among teachers and frequent closure of such schools (Singhal 1983). A secondary school, in this way, has to monitor, supervise, and counsel the junior schools and be an agent of bringing about internal efficiency in the system as well as of raising the quality of teaching-learning of the member-schools, which in turn would help to raise its own quality and performance. The school complex system has come into being in some countries like India, Thailand and Sri Lanka on a small scale or on an experimental basis. The results are quite encouraging. This innovation requires to be institutionalised on a wide scale and the secondary school will, obviously, have to discharge an important role in it.

One of the major areas of concern in secondary education is its examination system, which has become too unwieldy due to the importance the school leaving certificate assumes. The certificate that is awarded is more or less a passport to jobs, admissions to higher studies and even matrimony! There is corruption in examinations. Apart from large-scale cheating which has a highly adverse influence on teaching-learning, question papers are sold in open markets. The examinations which earlier used to dominate the class room instruction as it was geared to the requirements of the examination, have now practically become a farce. The whole examination system at the secondary stage, therefore, needs to be decentralised. If these examinations can be held at inter-school-complex level, much of the credibility which they have lost can be regained. It will also have a salutary effect on the teaching-learning process as it can then be related to local environment and enough freedom could be given to teachers to experiment and innovate.

Institutional planning

And finally, the future of the secondary school will be bright if each school undertakes institutional planning, as such planning will help to optimise its scant resources. The cost per pupil in secondary education is estimated to be twice the cost per pupil in primary education (IIEP 1978). In other words, enrolling one more student in secondary education is equivalent to enrolling two in primary education. Although the latter will continue to occupy higher priority until at least the turn of the present century in most countries of the region, secondary education will also continue to grow. Institutional planning will contribute to optimisation of the available funds and meet the growing requirements and the challenges of the future secondary school. It will also enable the school to undertake self-evaluation and monitor its programmes, projects and activities. With the huge expansion of school education in the public sector, school inspectorates have become non-functional. They are neither able to supervise school nor give any guidance and counselling. Institutional planning will be a means to obviate the difficulties which are faced by the inspectorates and provide necessary autonomy to secondary schools to plan and manage their activities.

Need to break away

The secondary education of the future is, thus, full of promise and challenge. It has to mould itself to suit the emerging changes and break away from the traditional rigidities and systems. The present concern for reforming it provides enough hope that the future is not bleak.

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Vocationalisation of Higher Secondary Education or Vocational Education?

A Constructive Review for a Viable System

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Vocationalisation of Higher Secondary Education or Vocational Education?

A Constructive Review for a Viable System

UNIVERSALISATION OF PRIMARY EDUCATION IN THE COUNTRY HAS provided an impetus for children who hail from disadvantaged and rural communities to prolong their education at the secondary stage. There has been increased demand for establishment of larger numbers of high schools and larger admissions into the existing ones. As a sequel, the number of high school leavers has increased while the quality of instruction has suffered rather alarmingly.

At present, the number of high school leavers is estimated to be over 2 millions annually, of whom 200 to 300 thousand may drop out for various reasons. This leaves about 1.7 to 1.8 million aspiring students who would like to continue their education in one form or another. The larger component of this number enters the traditional junior/intermediate colleges which offer university preparatory programmes of study in arts, science and commerce. The number of these colleges in India is about 6,000 and they admit, on an average, about 200 per college, accounting for about 1.2 million successful high school leavers. Many of the colleges are ill equipped and several known to be good ones are abnormally over-crowded, the result being increasingly lower standards of instruction. The situation is likely to become more acute as the number of high school leavers continues to grow and their aspirations rise.

The other avenues available to the students at this stage are entry into technician courses offered in the polytechnics, craftsman training programmes provided in the Industrial Training Institutes, para-medical courses offered in nursing, dental and pharmacy schools and home science courses offered in home science institutes. A number of commerce institutes also provided training for secretarial occupations. A generous estimate of the number of high school leavers entering all these institutions would be around 2.5 to 3 lakhs. There is still left over a quarter million who cannot enter any type of institution, academic or para-professional. This unlucky segment is generally dubbed as too 'intellectually ordinary' to secure admission into any type of existing institutions.

In a democratic society it would be grossly unfair to characterise a section of students as 'ordinary' and to deny them opportunities of preparing themselves for occupational careers. It should be the fundamental responsibility of a state to provide for every section of youth a large number of avenues of education or training, or a combination of both, so that every youth is enabled to make his choice according to his means, aptitude and inclination, and flower into a productive citizen and contribute to the social and economic goals of the people among whom he lives.

Moreover, one should not fail to note that those who are considered ordinary may really not be ordinary and have been so categorised because of the vagaries of the prevalent examination system. Cut off points for admission into para-professional institutions are observed to be 60 per cent marks or higher in the qualifying examinations. One may be lucky to score a mark or two above the cut off point and secure admission or unlucky to get excluded by a mark or two below. There is no reliable discriminative means of judging suitability for any type of education of a student or for a course in the present selection procedures. Therefore the difference in intellectual ability between one who is admitted and one who is rejected is so thin that it is preposterous to adjudge the rejected as 'ordinary'. Those who are academically 'ordinary' may be exceptionally talented in practical arts and any facilities provided will brighten their career prospects.

Often, social and economic conditions lead sensitive good students to the realisation that pursuit of general education does not equip them with any special skills which would prepare them to enter gainful occupations, while, at the same time, they cannot afford a relatively expensive para-professional programme of instruction. Any less expensive alternative system which imparts the kind of knowledge, skills and attitudes and enables them to enter the world of work would be greatly welcome to this section. Such a system, even as it meets the aspirations of this class of youth, must offer a variety of useful programmes which are generally not offered in the traditional system but for which there is imperative need.

Need

A logical starting point for formulating and planning the country's education and training system should then be a broad analysis of its present and emerging needs of qualified manpower in critical economic and developmental sectors and the facilities already available. To neglect a systematic analysis of needs may result in expensively wasteful efforts to produce the wrong kinds of skills, while really urgent requirements for other types of skills, that are so scarce as to constitute bottlenecks in the country's development, go unattended. It is in the knowledge of all those who are controlling the economical, sociological and developmental activities of the country that the traditional para-professional institutions are generating an over-supply of certain traditional skills, while a host of newer ones remain unsupplied or undersupplied, especially in the defence, transport, construction and health sectors. This anomaly has to be speedily removed if our concern is to supply, in a balanced manner, the requisite kinds of competencies in required numbers.

In the modern society a host of new demands has arisen, especially in the field of services requiring specialised technological knowledge and skills in a variety of applications. The number of such skills will grow as technology advances and the society presses such advances into human service. It should be one of the purposes of education and training system to prepare adequate numbers of service technicians to cope with the ever-growing demands. Such a system should aim at increasingly developing entrepreneurial capabilities in the youth so that the society gets its services attended to efficiently and employment potential grows steadily.

In our country, 75 per cent of the population resides in the villages and the facilities provided to the rural youth to develop capabilities through education and training are far less than those extended to urban youth. Almost all the para-professional institutions are in urban or semi-urban centres and thus the rural youth have very few opportunities, limited as they are by their economic conditions, to avail of such facilities. If there were a relatively inexpensive system of education and training available nearer home, they could stay with their families and avail of the opportunities and programmes offered. If these are such as would enhance their knowledge and skills for better performance of their family or local occupations, it would boost regeneration of rural occupational capabilities with modern scientific and technological applications. Demand for rural services is also growing rapidly and such services have to be developed in the villages themselves. The system will thus have the dual effect of generating the self-reliance of the rural community for a purposeful life and enhancing entrepreneurship capabilities among its youth. As rural life gets modernised, migration to the towns and cities will increasingly taper off to manageable proportions.

It can therefore be visualised that any alternative system of education should necessarily take into account the sections of student population for whom the existing systems cannot provide suitable facilities. The new system should take into consideration the service needs of each locality, the economic capacities of aspiring youth, the knowledge and skill requirements for employment, the special traits to be developed for entrepreneurship, and initiate a process which should promote change in the social environment.

Characteristics

Requirements for employment in terms of knowledge and skills vary widely in different occupational sectors and they have to be met by wide-ranging programmes of instruction and training with built in flexibility in their durations. A rigid system, as now prevails, will be highly unsuitable as it prevents innovations and design of unconventional programmes. In other words, the new system should envisage unconventional structures to meet the specific and special demands of the world of work, structures characterised by differing durations of study and training. A further characteristic of the new system should be that it builds into the system ample scope for continuing education in the fields of first study so as to enable those who desire to improve their employment potential by acquiring superior skills and higher knowledge to do so. When such facilities are available, it should be possible for an aspiring youth to satisfy his urges according to his needs and convenience and not to get influenced by the craze for university education. The significant gain would then be a reduction in the pressure of demand for university education with consequent improvement in its quality and standards.

In the light of the foregoing overall concepts, we will have to consider what should constitute such a flexible education and training system which, along with suitable structural modifications in the existing para-professional systems, will meet the aspirations of all those for whom no provision has so far been made and develop capabilities essential for the overall economic welfare of the society. As an alternative, will it be appropriate to consider a National Vocational Education System which would cater to all the para-professional needs of the country, of which the existing polytechnics, industrial training institutes, para-medical, agricultural and catering institutes would form sub-systems? What then should be the national aims and objectives in this behalf and what planning authority and organisational structures would have to be established to coordinate and harmonise manpower generation efforts at the national and state levels? Will such a set-up be able to rationalise procedures so as to achieve national goals without duplication of effort in different departments of the governments and thus be able to effect economy of resources so that other equally important nation-building activities do not suffer? These basic questions require pragmatic consideration by the planners who are entrusted with the task of re-formulating educational priorities and providing an adequate thrust for their achievement in a reasonably short period.

Vocational not vocationalised education

A variety of alternatives may recommend themselves for careful consideration and each of them may have its merits and shortcomings. Of them, two alternatives are engaging current thinking, viz. vocationalisation and 'vocational education' at the higher secondary stage.

The term used to describe the first of the two alternatives itself declares that the entire higher secondary stream is to include a vocational element as an optional subject, such as physics or mathematics or commerce or history in the curriculum. The ostensible expectation is that such a scheme will harmonise intellectual and physical skills in the formal systems for a fuller development of the personality of the youth and prepares them for gainful occupations or careers in a civilised society. None can dispute the desirability of the objective, but the objective should be attainable under the nation wide practical constraints. However, if the country has the capacity and means to find solutions and remove the constraints, and the education and training system is geared to achieve the set goals in a reasonable length of time, without frustrating the aspirations of the youth who are to be the beneficiaries of the system, it should be adopted without batting an eyelid. The most important concern should be the design of a system which develops capabilities and attitudes that would enable adaptation to the fast-moving scientific and technological advances and impart to youth the expected knowledge, skill and attitudinal requirements.

The present curriculum of 'general education' ordinarily devotes about 50 per cent of instructional time for languages, social science, sports and games, and the other 50 per cent for optional studies. Then, for each optional component, about 12.5 per cent of instructional time is all that is available. Suppose one optional subject is removed and a vocational subject is introduced in its place, it will occupy 12.5 per cent of the time. In an academic year of about 200 days, the number of working hours, excluding examinations etc., will be approximately 800 of which 12.5 per cent will be just 100 hours for vocational theory and practice. If 20 to 25 hours are given to theoretical instruction in a vocation, we are left with 75 to 80 hours for development of practical skills in an academic year. If we wish to increase the number of hours for vocational studies further we will have to prune other subjects such as languages, social science etc., which, in effect, reduces the academic equipment for higher education as these courses are college preparatory. Even when the vocational component is given the weightage of two optionals, i.e. 25 per cent of the instructional time, amounting to about 160 hours per year, it is doubtful whether the student would develop adequate skills for an identified job and be ready to adapt himself to its changing requirements. On the other hand, it would also be difficult to satisfy the requirements of university education. In other words, the student would be neither here nor there; for, the world of work would consider him half-baked and the university would consider his preparation for higher education poor. This line of thinking thus seems bereft of practical utility.

If our real concern is to provide facilities for a sizeable section of students for whom bread-winning is far more important than the pursuit of higher education, and to prevent an unhealthy influx into higher education institutions, leading to increasing mediocrity in higher education, it is essential to evolve a system of education and training, quite apart from general education, which aims to prepare youth for prospective occupations. This preparation can be best done only in what may be called Vocational Education Institutions.

National Vocational Education System

If this thesis is acceptable, we have only one choice (until a better one is evolved), viz. a National Technical and Vocational Education System. Such a system will be need-based and generally area-specific, so that its products, on the completion of their training would possess the kinds of skills and knowledge needed by the community and would be able to contribute to the improvement of quality of life, even as their own lives blossom in purposeful endeavour. The system should be flexible in curricular content and period of education and training, and have close linkages with the employment world.

The system should also embrace all vocational and para-professional training programmes, to enable the country to plan, organise and execute an integrated manpower preparation scheme and avoid multiplicity of efforts by several departments and agencies simultaneously. The apparently diverse systems operating in isolation at present will become subsystems performing specific allotted tasks without frittering away their energies, time and resources, and simultaneously allowing other sub-systems to supplement their efforts and contribute to overall manpower development. The new entrant into this overall system would be the Post-Secondary Vocational Education sub-system whose chief aim and relevance would be to offer relatively less expensive courses of education and training but with the capacity to prepare those who are denied opportunities in other sub-systems or not possessing the required aptitudes for local occupations.

Characteristics of the sub-system

The kind of sub-system recommended by the NCERT, as formulated in its document, 'Higher Secondary Education and its Vocationalisation', and subsequent modifications, are attempts in this direction. It is unfortunate that several phrases and words used in these documents have caused confused perceptions and these perceptions have been worse confounded in the act of implementation in the states. Barring a couple of exceptions, the experiences have been unhappy and are bewildering in number and variety. Clear evidence is visible that the system will founder unless immediate steps are taken to give explicit clarity to concepts, perceptions and language. The chief objectives of the sub-system should be:

1. to create facilities for and offer a variety of vocational programmes to all those whose chief aim is occuptional preparation after successful completion of high school education;
2. to design courses appropriate to the different occupational requirements and offer them over durations which would enable students to develop the desired competencies and personality traits;
3. to adopt a semester system for instruction and training and limit admission to each course to 25 to enable personal attention to students;
4. to establish linkages with the employing agencies to facilitate easy absorption after completion of studies and training and also to secure access to on-the-job training during the courses;
5. to provide for continuing education for all those who are in jobs or who desire to acquire higher levels of knowledge and skills to fit into superior levels of occupations in the chosen fields;
6. to develop capabilities for entrepreneurial ventures in the community; and
7. to economise on investments by utilising available local resources, involving participative efforts with prospective employers, and thus make the system less expensive.

To achieve the above objectives, courses have to be very carefully chosen, based on reliable information and data on the current and anticipated economic and social development activities of the locality, which may well be a district, the local resources of which could be pressed into service for training, curriculum making and collaborative instruction in the vocations and, most important of all, in building good institutions which can translate the concepts into viable action plans. This could be done by a well designed occupational survey and on-the-spot study of institutional capabilities.

Institutions for vocational instruction

Experience has shown that the general education higher secondary schools are for various reasons not ideal for imparting vocational instruction. This leaves us two alternatives for consideration, keeping in view the limited resources that the country can invest in the system. Of about 6,000 institutions offering higher secondary education, about 2,000 or so could be converted into vocational institutions which can provide instruction in occupational programmes, utilising all their current facilities. Alternatively, a number of strategically located good high schools could be upgraded to provide vocational courses and develop them with necessary equipment, library and other infrastructural facilities. This alternative can provide for introduction of vocational programmes from even the 9th or 10th standard if desired. The number of such schools, together with vocational higher secondary institutions, may be 3,000 to 4,000 over the entire country.

Organisational system

Effective organisation is the key to the success of any scheme and the machinery which is entrusted with the task of implementing it should have a clear perception of the various elements of the proposed scheme to enable it to formulate implementation tasks in simple clear terms. A good plan should precede the organisation scheme and effective implementation should succeed the organisation scheme. Among the various elements, apart from adequate infrastructural facilities, the single major one on which success depends is supply of suitable teaching faculty imbued with a sense of purpose and dedication to the system. An equally important requisite is the availability of suitable equipment and authentic instructional materials prepared in simple language.

Teacher preparation for unconventional vocational programmes is a serious job. To impart skills of required depth and quality only those who have specialised experience will have to be appointed and such instructors are not easily available. While attempts to generate a new class of teachers should be planned, it would be most fruitful immediately to employ part-time instructors from the occupational fields and collaborating enterprises for skill instruction and such people may be drawn from the community of retired personnel. Retired defence personnel, bank managers, stenographers, nurses, doctors, agriculture extension officers and so on will serve the purpose eminently.

Since the vocational programmes are need-based, and their durations differ they cannot fall into a rigid pattern for evaluation and certification of the conventional systems. Levels of competencies should form the basis of certification and they can be classified according to the requirements of the employment world. The certificates may indicate the knowledge and skill levels reached and the minimum proficiency to be expected. If need be, two or three types of certificates may be considered to distinguish between the higher and lower level competencies and should be recognised for certain classes of employment in government departments and the public sector organisations. Whatever the certification procedure, the students will have to find their own levels in the world of work and success or failure of the system will then be measured by the success or failure of the products.

The country's education system is at a critical stage. An imaginative but pragmatic system will have to replace the outdated and fossilised conventional system. Improvement of quality of education at all stages is imperative. While higher education cannot be ignored, it should be available only for the deserving and those who can afford it. For the majority, a National System of Vocational Education is the only answer.

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Interestingly, even though the articles we
compiled before the adoption of the Nationa
Policy on Education, 1986, the authors have on
their own carried quite a few commonalities i
their articles with the policy. This is perhaps
because of their life-long experience and dee
insight in the content and process of educatio
in this country. The compendium has a wid
range of coverage from the nature of education
in general and through assessment of the
present to projection of the future of school
education in India. Moreover, some specific
aspects like teacher education and language
instruction have been highlighted. Advanced
students of education may find the book useful
for reference. The book will certainly be of
interest to everyone interested in Indian
Education, specially in the developments in
school education.

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